SEPTEMBER, 1935

COTTON

Serving the

TEXTILE INDUSTRIES

5661 1930

Making Lower Twisting Costs a FACT Instead of a Theory

THE theoretical advantages of large package twisting are well known: increased production and reduced twisting cost due to fewer doffs; costs in subsequent processing also should be reduced because of the larger supply, fewer knots and the possible elimination of rewinding.

However these advantages have been largely nullified in the past, because of the fact that, as the size of the ring was increased, it was found necessary to make a corresponding decrease in the speed of the spindle, thus cutting down production.

H & B Large Package Twisting is offered to the trade with the assurance that the necessity of reducing the spindle speed has been eliminated in almost every case. For example the diameter of H & B rings has, in many instances, been increased as much as 50 percent and more without any decrease whatever in spindle speed, and in many cases it has been possible to actually increase the speed of the spindle.

This important advance in twisting is due to numerous factors, including proper clearance and even tension of the yarn in the creel, correct angle of pull from the feed rollers, and proper design of spindle and drive (positive, minimum slippage of tape, etc.). A very important factor is the size and design of the ring for each particular job, in combination with a properly balanced traveler, which at the same time allows for longer traveler life.

The knowledge on which this progress is based is not something that can be duplicated overnight. It has been gained by many months of painstaking experiments and its value to you can be many times the price that you pay for the new H & B Twisters.

Tell us your twisting problem and we will tell what we can do for you. No obligations of course.

H&B

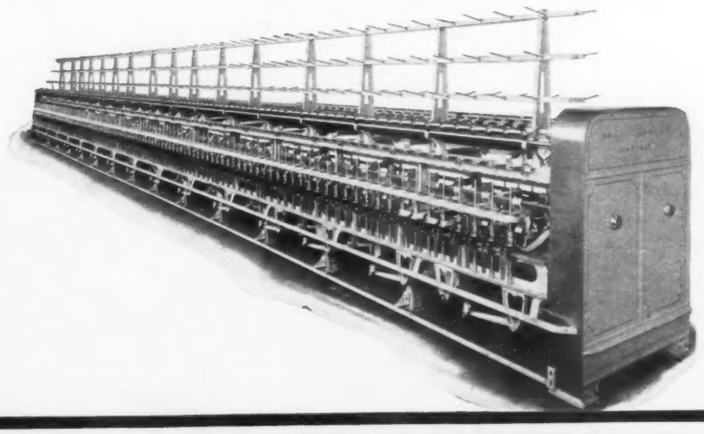
• • • FEATURES • • •

Increase in ring diameter up to 50 percent and more.
Traverses increased as much as 5 inches over old standards.
Spindles designed for high speeds and heavy loads.
Pull of yarn from creel is free, easy and unobstructed.
Gearing permits a wide range of twist.
Reversible tape drive. New design Tension Device allows proper tension on tape, so as to insure steady spindle speed without causing undue strain on the spindle bolster.
Frame is sturdily built and properly balanced throughout to minimize vibration.

LARGE PACKAGE TWISTER

BOSTON OFFICE
161 Devonshire Street

ATLANTA OFFICE
815 The Citizens and Southern National Bank Building



COTTON PREPARATORY AND SPINNING MACHINERY

H & B AMERICAN MACHINE COMPANY • PAWTUCKET, R. I.

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ACHIEVEMENT
IS BORN OF
EXPERIENCE

IF YOU WANT THE FORMER, YOU MUST SEEK THE LATTER

Michael Angelo completed his famous ceiling decorations in the Sistine Chapel, Rome, in only 22 months of actual work on the ceiling. Actually however it was 24 years of previous EXPERIENCE, involving incessant study and labor on other projects, that gave immortality to these paintings.

Franklin Process to-day dyes yarns in the package form with difficult shades in record time, at reasonable prices, and with seeming ease. However, were it not for a quarter century of EXPERIENCE in package dyeing, what now seems easy might well prove an unsuccessful and costly experiment for all concerned.

Good package dyeing requires much more than just package dyeing machines. Admitting the superiority of this type of machine (properly designed) over older types of yarn dyeing equipment, it still does not eliminate the need of human knowledge and ingenuity in the preparation and application of the dye bath by the package method. Furthermore the ONLY way in which much of the necessary knowledge can be gained is by EXPERIENCE.

That is why to-day Franklin Process can successfully do certain classes of work which in the past were considered unsuited to package dyeing. That is why Franklin Process dyeing, on all classes of work where it is used, has steadily improved until it is unsurpassed, and in some cases even unequalled, in quality.

Dont judge Franklin Process Custom Yarn Dyeing by your acquaintance with it 25, 10 or even 3 years ago. See what it can do for you TO-DAY. ✓ ✓ ✓

Custom Yarn Dyeing

Natural Yarns Colored Yarns

Glazed Yarns

Dyeing and Processing Machines

THE COLORED YARNS IN THIS FABRIC ARE FRANKLIN PROCESS DYED FASTNESS TO WASHING AND LIGHT GUARANTEED IMPECCABLE

When you pay for colors of KNOWN fastness, advertise the fact. Use the Franklin Process Fast Color Label. Ask us about it.

FRANKLIN PROCESS

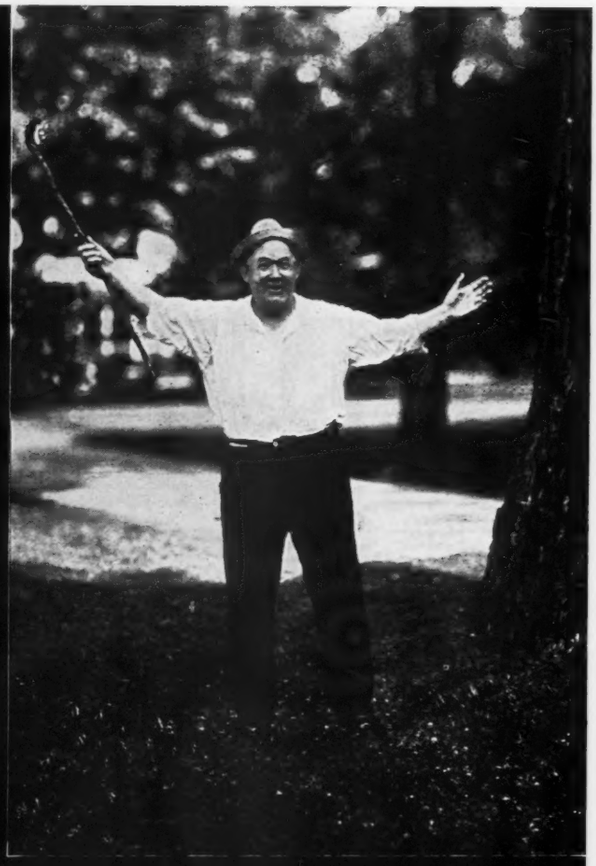
ESTABLISHED 1910

Pioneers in Package Dyeing

PROVIDENCE • PHILADELPHIA • GREENVILLE • CHATTANOOGA • N. Y. REPRESENTATIVE, 40 WORTH ST.

COTTON is published monthly by W. R. C. Smith Publishing Co., Dalton and Aalan'a, Ga. Subscription Rates, United States and Possessions, $1.00 for one year; $2.00 for three years; Canada, $1.50 per year; Foreign Countries, $2.00 per year. Entered as second-class matter at the postoffice, Dalton, Ga., under the Act of Maroh 3, 1879.

He Carries a Cane to Make His Friendly Greeting More Expansive



Although on Days He is not Busy in Our Shop He Walks 10 Miles for his Health —Which is as Bubblingly Exuberant as His Greeting is Inspiring After Nearly 50 years a Draper Workman Pat Dillon Has Use for his Cane only to Wave Happy Greetings to Friends He Meets

Always Happy—Always an Optimist—Pat Keeps Himself Fit for His Job—for His Simple Kindly Neighborly Living

An Optimist a Go-getter Optimist—He Walks in the Rain to Keep Fit to Enjoy the Sunshine of the Morrow

The Homely Philosophy of Optimism—the Go-getter Optimism with Faith in the Future and the Will to Win—Built the American Textile Industry

It Kept Builders of Textile Machines Busy During the Dark Days of Our Depression Designing New Tools to Fit Your Mills for a Better Tomorrow

It Should Prompt Mills That Would Prosper to Make Their Equipment Fit Now—Ready to Start a New Run without Handicap

Looms of Our X Family Run 20% Faster

DRAPER CORPORATION

Atlanta Georgia Hopedale Massachusetts Spartanburg S C

MEN *as well as machines* need "LUBRICATION"

What is "Lubrication" . . . Who is it for . . .

"Lubrication" is a technical bulletin that deals accurately, authoritatively with specific matters of lubrication. One issue may deal with a specific type of machinery such as air compressors. Another issue may deal with all the types of machinery used in a particular field — such as coal mining.

For instance, in 1934, "Lubrication" dealt with these important matters —

Plain Bearing Design, Construction and Composition.

Electric Motor Lubrication—Protection Against Dust and Water.

Textile Machinery — Improvements in Design and Methods of Lubrication.

Lubrication Requirements of Metal Forming Machinery—Thin Oil Film Lubrication — Lubrication Service.

Variable Speed Transmissions — Thin Oil Film Lubrication.

"Lubrication" is written for the management seeking more economical plant operation. It is written for the engineer, the superintendent, the machine operator who desires to keep his machinery working at peak efficiency. It is for the man interested in technical matters and the man concerned with practical matters.

Why is "Lubrication" valuable... How can it be used . . .

"Lubrication" is valuable because it gives you data on the latest plant practices in keeping machinery operating efficiently and economically.

"Lubrication" can be used by the executive as a guide to economies in power, maintenance. The superintendent, foreman, machine operator will find it a valuable aid. Engineers will glean from it much helpful data.

When and where can you get "Lubrication"

"Lubrication" is issued once a month. It is published only by The Texas Company. There is no cost or obligation involved in being a regular reader of "Lubrication." It is offered absolutely free.

There is an easy way to get "Lubrication" every month. Simply send in your name, address, business connection. One idea from "Lubrication" will more than pay you for this small effort. Plant executives will find no quicker way of helping their men devise important efficiencies than by encouraging them to expand their knowledge of up-to-date lubrication practice. "Lubrication" provides this information free every month.

THE TEXAS COMPANY
135 East 42nd Street New York City
Nation-wide distribution facilities assure prompt delivery

THE TEXAS COMPANY, Dept. B 9
135 East 42nd St., N. Y. C.
Gentlemen: Without cost or obligation put me on your list to receive "LUBRICATION."
Name_____
Firm_____
Address_____
Position or Dept._____

TEXACO *tested* LUBRICANTS

REFINERY TESTED FOR UNIFORMITY • • • SERVICE TESTED FOR ECONOMY

WELCOMED
TO YOUR ROUND TABLE
FOR IMPROVED DESIGN
In hundreds of plants across the country New Departure engineers are welcome. They bring a fresh viewpoint with suggestions for improved design, based on facts—and case histories. The most efficient design is a matter of cooperative and constructive thinking across the table—or at your desk. Just say that you would welcome us at your round table and we will be on our way. The New Departure Mfg. Company, Bristol, Connecticut. Sales and Engineering Offices at Detroit, Chicago, San Francisco and London.
NEW DEPARTURE
BALL BEARINGS
Nothing Rolls Like a Ball

Announcing 3!

NEW SOUTHERN OFFICES

Comer Building
Birmingham, Alabama
L. H. Kelley, Manager

North Carolina Bank Bldg.
Greensboro, N. C.
W. R. Joyner, Manager

Hurt Building
Atlanta, Georgia
C. G. Stover, Manager

These new centrally located offices are, of course, in addition to the already well established ones at

Woodside Building
Greenville, S. C.
John R. White, Manager

Montgomery Building
Spartanburg, S. C.
J. Cantey Alexander, M'gr.

Mr. John R. White will continue to act as General Manager of the Mill Starch Division throughout the South. Mr. J. Cantey Alexander has been appointed Assistant General Manager.

- These five Southern branches are now capable of offering better service than ever before—and are prepared to help you solve your problems by placing at your disposal the facilities of our Technical Service Department.

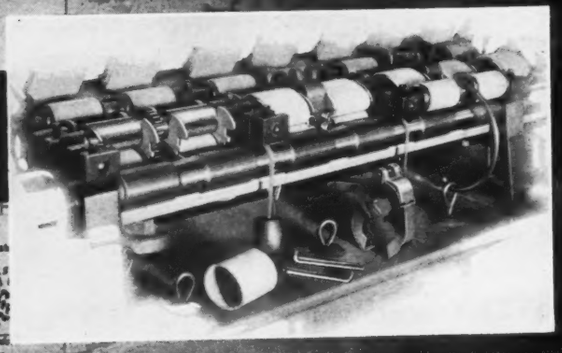
CORN PRODUCTS SALES COMPANY
17 Battery Place **N. Y. City**

WHITIN

THE WHITIN-CASABLANCAS LONG DRAFT SYSTEM
embodies the principles pioneered and developed by Casablancas and adopted by the World's Textile Mills.

For Slubbers • Intermediates • Fine Roving

- Fewer Roving Spindles
- Reduced Card Room Costs
- More Even Roving

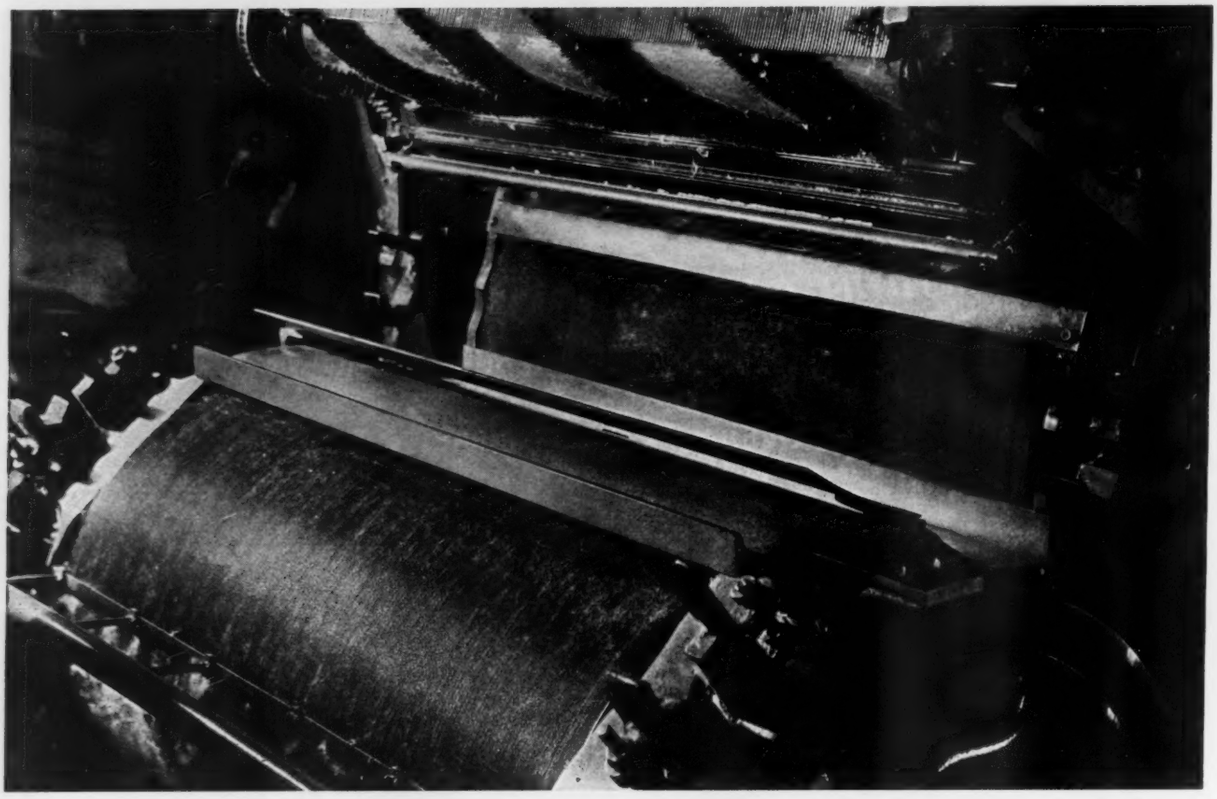


For Spinning Frames

Evener and Stronger Yarns • Fewer Ends Down per Thousand Spindles • Cleaned without Losing Production

IN UNIVERSAL USE

"TUFFER Card Clothing has been on our cylinders over 20 years"... says a fine stock mill



EVERY operation in making TUFFER Card Clothing is governed by standards of accuracy notable for their precision. It is possible to produce good card clothing without such high standards and pride in craftsmanship. But it has always been our policy to make doubly sure. That's why it is not unusual for TUFFER Card Clothing to give performance for twenty years or more.

The patented foundation of TUFFER Clothing supports the card wire better and, when applied to the drum, "stays put," firm yet flexible.

TUFFER CARD CLOTHING

The quality of materials plus the quality of workmanship result in better and longer performance in the card room.

Seven out of ten mills rely upon TUFFER Card Clothing. If you have never tried TUFFER in your card room, get acquainted with a trial order of fillets or flats. The best proof is a test in your own mill.

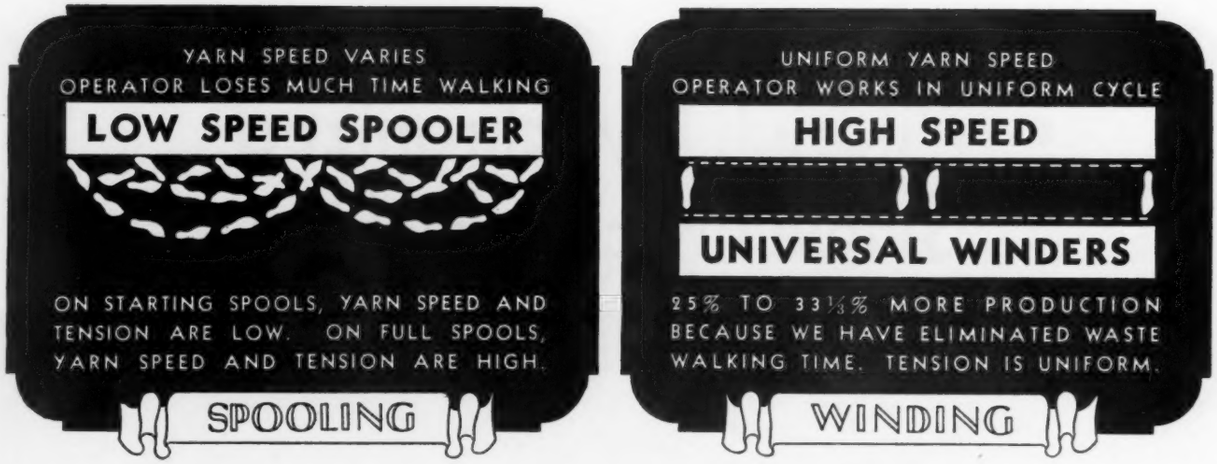
Write the nearest Howard Bros. office for quick and dependable service.

HOWARD BROS. MFG. CO.

HOME OFFICE AND FACTORY: **WORCESTER, MASS.**

So. Plant: 244 Forsythe St., Atlanta, **Branch Offices:** Philadelphia, Dallas, Washington

Products: Fillets for Feed Rolls, Lickerins, Tumblers, Strippers, Workers, Doffers, Fancies, and Cylinders, Doffer Rings, Napper Clothing, Strickles, Emery Fillets, Burnisher Fillets, Top Flats Recovered and extra sets loaned, Lickerins and Garnett Cylinders from 4 to 30 inches and Metallic Card Breasts Rewired at Southern Plant. Midgley Patented Hand Stripping Cards and Inserted Eye and Regular Wire Heddles


YARN SPEED VARIES
OPERATOR LOSES MUCH TIME WALKING
LOW SPEED SPOOLER
ON STARTING SPOOLS, YARN SPEED AND TENSION ARE LOW. ON FULL SPOOLS, YARN SPEED AND TENSION ARE HIGH.
SPOOLING
UNIFORM YARN SPEED
OPERATOR WORKS IN UNIFORM CYCLE
HIGH SPEED
UNIVERSAL WINDERS
25% TO 33⅓% MORE PRODUCTION BECAUSE WE HAVE ELIMINATED WASTE WALKING TIME. TENSION IS UNIFORM.
WINDING

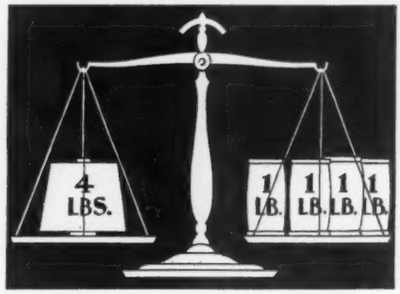
THE ROUTE THE OPERATOR WALKS IS A SOURCE OF *Waste* OR *Profit*

The operator of a Universal Winding Machine produces 25 to 33⅓% more than a spooler operator because the uniform yarn speed of the winder makes it possible for her to work in a uniform cycle—saving the thousands of footsteps which are simply a waste of production time.

The work of the operator is further simplified by the large 4-lb. cone replacing the small 1-lb. spools which allows more time for productive work. The larger package also saves 75% of the cost of creeling and 75% of the cost of trucking.

Any high speed system will bring savings over slow speed warping, but in 3 out of 4 mills, the Universal System of High Speed Coning and Warping gives a greater net return on the investment because, in addition to the reduction of non-productive time—

(1) it has the lowest investment cost.



(2) depreciation cost, throughout the life of the machine, is lower than with any other system.

(3) its maintenance cost runs less than $50.00 a year on a $10,000.00 investment.

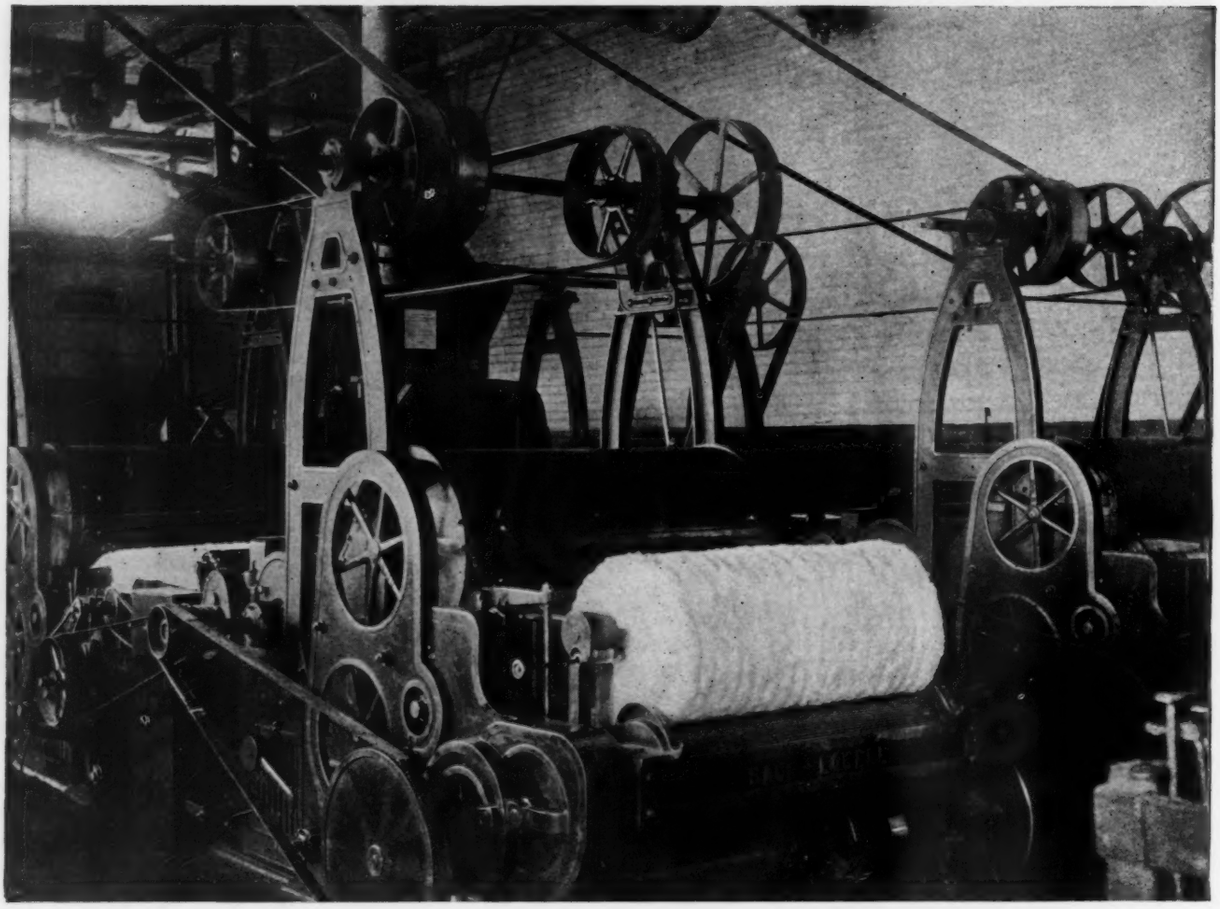
And as far as weave room savings are concerned, loom stops are reduced because the natural elasticity of the yarn is retained, spooler kinks are eliminated, and lost and crossed ends in the loom beam are prevented by the electrically controlled stop motion on the warper.

In the light of these facts, an estimate of savings and investment will probably show that your mill will receive its greatest net return by investing in the Universal System. It will cost you nothing to find out. We suggest you address a letter to Dept. A, Boston, or the branch office nearest you.

IN 3 OUT OF 4 MILLS MORE NET RETURN
Universal System of High Speed Coning and Warping
UNIVERSAL WINDING COMPANY
BOSTON
NEW YORK · PHILADELPHIA · PROVIDENCE · SPRINGFIELD · UTICA · CHARLOTTE · ATLANTA

Modernize your Picker Room with

Aldrich Synchronized Single Process Picking.



The most widely used single process picking system in the Textile Industry.

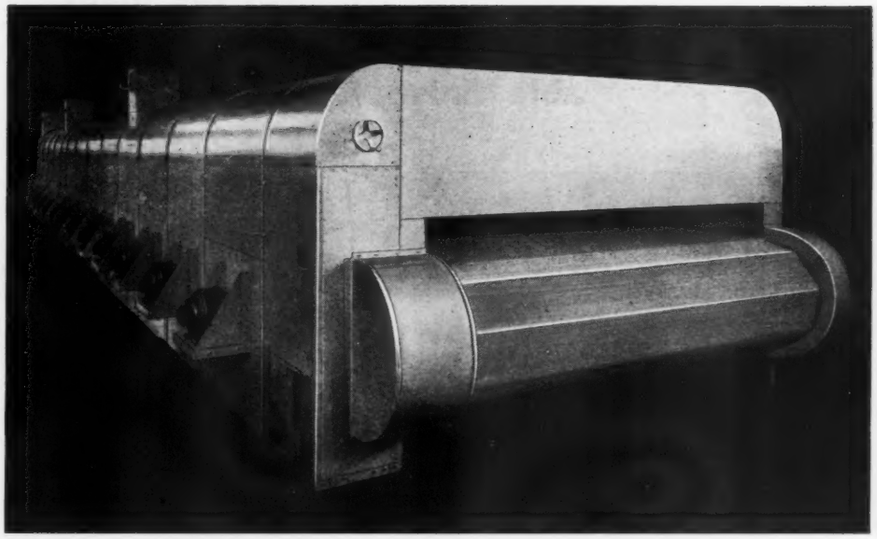
Simple—Inexpensive—Efficient—

Made and Installed by,

AldricH MachinE

Greenwood, WorkS South Carolina

Modern Drying Equipment



One Apron Stock Dryer

NEWEST DESIGN

A leader in its field. This Sargent Stock Dryer has proven its worth to many satisfied users. This general acceptance by owners can be attributed only to the superiority of design, materials and workmanship so characteristic of these machines.

FEATURES:

Centrifugal fans, direct motor connected, New type coils, Sectional Conveyor with speed control.

--NEW PATENTED CURVED TOP--

reduces air resistance—promotes free air flow.

SARGENT PRODUCTS

Acidifying Machine—Automatic Extractor—Automatic Feeders—Backwashers — Backwash Dryers — Bagging Machines—Ball Winder—Carbonizing Dryers — Cloth Dryers — Carbonizing Dusters—Cotton Stock Dryers — Crush Roll Machines — Press Roll Machines — Single Apron Dryer—Skein Dryer—Special Dryers — Wool Dryers — Wool Washers — Yarn Conditioners — Yarn Scouring Machines.

C. G. SARGENT'S SONS CORPORATION

Graniteville, Mass.—Founded 1852

Southern Agents:
Fred H. White, Charlotte, N. C.
Fred P. Brooks, Atlanta, Ga.

Philadelphia Agent:
F. E. Wasson,
Drexel Bldg.

SARGENT IS THE PIONEER AMERICAN BUILDER OF DRYERS

DU PONT
DULUX
REG. U. S. PAT. OFF.

IS WHITER AT THE START

•

QUICKER DRYING

•

EASY TO APPLY

•

MORE DURABLE

•

PRE-TESTED IN "LAB" AND PROVED IN ACTUAL SERVICE

•

TEST IT ON YOUR OWN WALLS

NEW DU PONT DULUX SUPER WHITE

THE NEW *10-point finish*

Beautiful enough for the finest home . . . yet the most economical and most serviceable finish for your factory

PLANT superintendents are thinking of this new and different finish as the most satisfactory and most economical mill white available today. They have seen actual demonstrations of its properties. They have proved its claims for superiority by using it in their plants.

What are some of the vital facts these men have learned? Three points of special importance are pictured here. But all the 10 Points are important to efficient, low-cost production. They affect *employees, goods, profits*. Decide to test DULUX Super White yourself. Be sure to send for the new folder offered on the next page.

1 DULUX STAYS WHITER

When it is first applied, factory engineers admire the extreme whiteness of DULUX. But as months turn into years they marvel at how white it stays. Long after other mill whites have yellowed with age, DULUX stays whiter.

At the left is an unretouched photo of a panel which has lain in darkness for a year. The finishes at either end of the panel are high-grade white enamels. In the center is DULUX. The enamels at top and bottom have yellowed to such an extent that they photograph gray. Did the DULUX yellow? Slightly, but hardly enough to be detected.

Surprising? Yet scores of factory maintenance men have proved the same thing by comparative tests on their own factory walls.

New DU PONT DULUX
REG. U. S. PAT. OFF. REG. U. S. PAT. OFF.
THE WHITE FINISH

for Factory Walls and Ceilings

2 DULUX STAYS CLEANER

Of equal importance to you is the amazing ability of DULUX to stay clean.

Super-White dries smooth and tile-like with no "after-tack" to catch smudges and dust. This means fewer repaint jobs— a better, whiter factory.

A panel finished for 30 days—half with one coat of DULUX and half with an orthodox mill white. We pour dirt on both sections.

Let us rub the dirt into the two finishes—thoroughly. A much severer test than any ever likely to take place in your factory.

Now we tap the panel and all loose dirt falls off. Note the difference. The DULUX finish at top has retained almost none of the dirt. The hard, smooth DULUX film dries without after-tack —does not pick up smudges and dirt, like slow-drying finishes. In appearance and in light reflection it has hardly been affected.

3 DULUX IS WASHABLE — EASY TO CLEAN

Cleaning of dirt-resisting DULUX is seldom necessary. Yet it can be washed easily and often, without injury to film. This panel, finished 30 days before with one coat of DULUX, has been marked with *red* and *black* inks and smudged with dirt and dust. One section has been washed with soap and water. ***It is CLEAN and WHITE again.***

WRITE for the complete story on all the 10 points in a new book—"DULUX—the White Finish That Stays White." But decide to try DULUX yourself. We will help you test it on your own walls. Write E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Del.

SUPER-WHITE

THAT STAYS WHITE

DU PONT

DULUX

REG. U. S. PAT. OFF.

STAYS WHITER

•

HAS EXCEPTIONAL HIDING AND COVERS SOLIDLY

•

COLLECTS LESS DUST

•

HAS HIGHER ORIGINAL GLOSS AND KEEPS HIGHER GLOSS

•

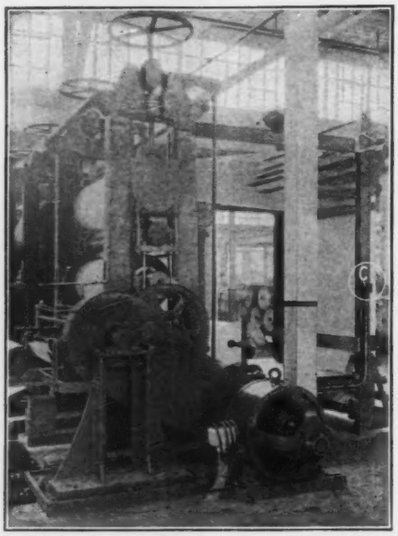
STANDS REPEATED WASHINGS

•

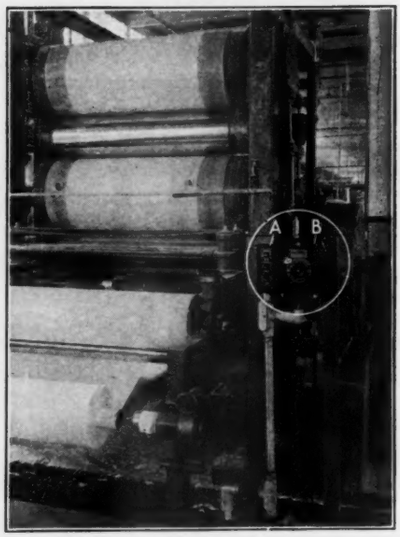
SEND FOR NEW BOOKLET

NEW DU PONT DULUX SUPER-WHITE

RELIANCE MOTOR-DRIVES *for* CALENDERS

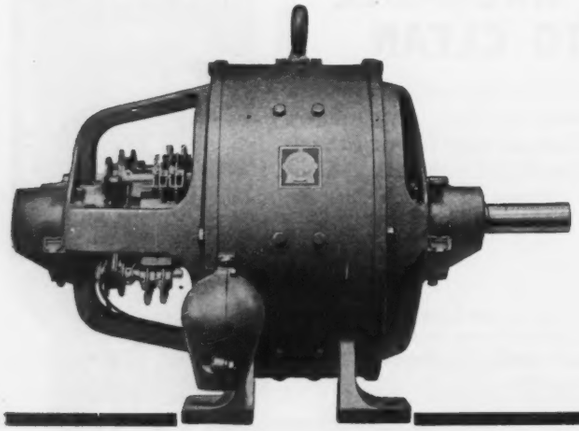


Five-roll Butterworth Chasing Calender driven by 25 hp. 500-1500 r.p.m. d-c. Reliance Adjustable-speed Motor with automatic push-button control.



- *Slow speeds for safe threading and inspection.*
- *The right speeds for fast running.*

HOW IT WORKS



The calendering speed is set with the rheostat "B".

Running speeds can be varied over a 3 to 1 range to suit various grades of cloth and other changing conditions.

Pressing the "inch" button causes the motor to run very slowly for threading. When this is completed the "slow" button is pressed, bringing the motor up to its normal speed of 500 r.p.m.

When everything is ready for going ahead at full speed the "fast" button is used and the motor speed increases to the point for which the rheostat has been set.

Once set for the desired calendering speed the motor may be stopped or slowed down as often as desired without giving further attention to the setting of the rheostat. The "fast" button always brings the motor back to the right speed.

Pressing the "stop" button at the station "A" or "C" brings the calender to a standstill quickly by graduated dynamic braking.

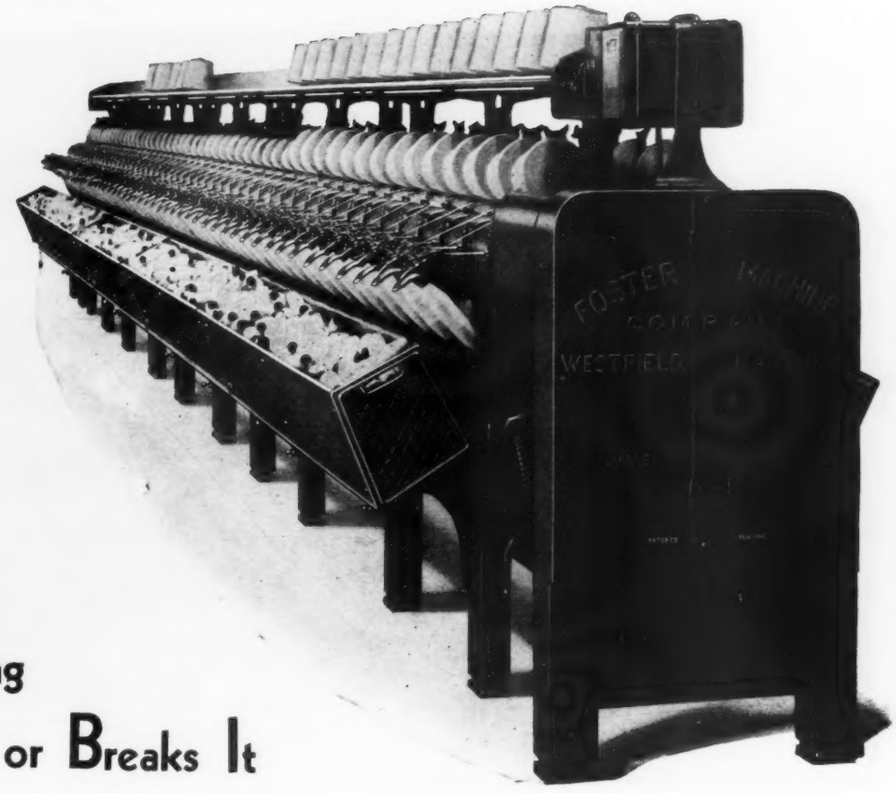
RELIANCE A·C D·C MOTORS

RELIANCE ELECTRIC AND ENGINEERING COMPANY
Ivanhoe Road, Cleveland, Ohio

Branches: Birmingham : Boston : Buffalo
Chicago : Cincinnati : Detroit : New York
Philadelphia : Pittsburgh : Washington
Representatives in other principal cities

★ ★ ★ ★ ★ ★

YOUR REPUTATION—



—Cone Winding Makes or Breaks It

The greatest possible care in all stages of knitting yarn manufacture, beginning with the selection of the staple and ending with the spinning or twisting, is nullified, if the mill delivers a *poorly wound* cone. Because cone winding is the *finishing process* in a spinning mill, it is the *last chance* to protect reputation.

The FOSTER Model 102 Cone Winder can be a most important factor in protecting the reputation of a spinning mill. It retains all time proven features of older FOSTER models and offers important improvements, such as 100 percent increase in production, more delicate manipulation of the yarn, additional slub catching, and exact lay of coils on the cone surface to reduce variation in tension at the knitting machine. In short, it makes FOSTER Cones, more than ever before—

"STANDARD FOR THE KNITTING TRADE"

FOSTER MODEL 102

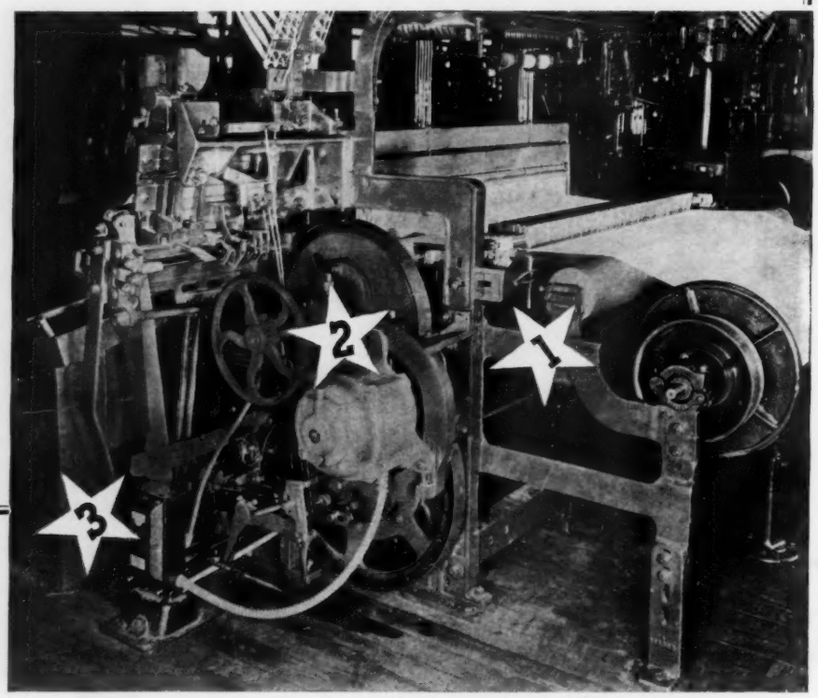
FOSTER MACHINE CO., WESTFIELD, MASS.

FRED P. BROOKS, REPRESENTATIVE, P. O. BOX 941, ATLANTA, GA.

★ ★ ★ ★ ★ ★

A *Tailor Made Drive*

for the S3 LOOM



A $90 suit of clothes isn't fitted any better to a man than the Westinghouse Loom Drive is fitted to the Crompton & Knowles S3 Loom.

▲You get the surplus capacity so necessary to prevent motor damage during the breaking-in period.

▲You get high-efficiency motors that squeeze the maximum amount of power from every watt.

▲You get a tried-and-proved control that really protects the motor against dangerous overloads.

Thirty years ago, Westinghouse initiated the use of individual motor drive for looms. Today Westinghouse is still pioneering in the development of loom drives that match the latest types of high-speed looms, such as the C & K models, S3, S4, C3, C4, W2, W3 and the Draper Models, X, C, XK and XL.

For additional information, write the nearest Westinghouse office. Westinghouse Electric & Manufacturing Co., East Springfield Works, Springfield, Mass.

R 61008

1 Crompton & Knowles S3 Model shuttle-changing silk and rayon loom fitted with Westinghouse 3-point suspension high-efficiency loom motor and its control. The motor windings are triple-guarded against damage from weave room humidity conditions.

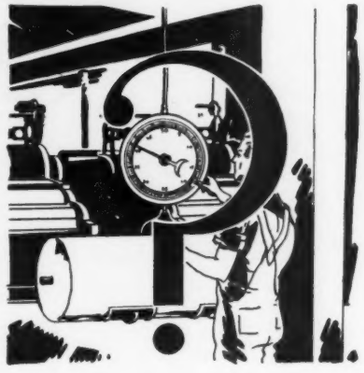
2 The bearings of Westinghouse 3-point suspension motors are designed for long life and low maintenance. Both front and rear bearings have easy-to-get-at oilers. Over-oiling and flooding of the motor is impossible—an overflow drains all surplus oil outside the motor.

3 The WK-18 Loom Motor Starter guards the motor against overloads. It is supplied with floor-mounted pedestal. Safe and positive in operation under high-humidity conditions.

Westinghouse LOOM DRIVE

You have less than a 50-50 chance of producing good yarn, *IF*

you are depending upon the unsupported judgment of your picker room operatives to determine the compensation in weight for each lap under constantly varying humidity conditions.

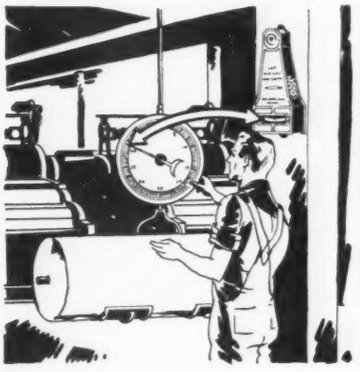


When the operative guesses wrong you get varying lap weights which mean poor yarn unless frequent and costly gear changes are made in roving and spinning frames.

AMCO Lap Weight Indicator Immediately Responds to Changes in Atmospheric Conditions

Operative sets the indicator at proper lap weight standard (for instance 40 pounds). The indicator, controlled by a superior hydroscopic element, shows the proper lap weight to compensate for the relative humidity of the day.

All the operator has to do is read the AMCO Lap Weight Indicator and be guided by the indicated weight. Laps of uniform cotton content result. Gear changes in succeeding processes are practically eliminated.



Factory-sealed against tampering the AMCO Lap Weight Indicator is guaranteed to perform properly.

AMCO LAP WEIGHT INDICATOR

The Watchman of the Picker Room

The AMCO Lap Weight Indicator is one more tangible evidence of the facilities of the American Moistening Company for supplying completely controlled humidification systems for the textile industry. Over 47 years of leadership in the production of this type of equipment is at your disposal when you call in the AMCO Engineer.

AMERICAN MOISTENING COMPANY

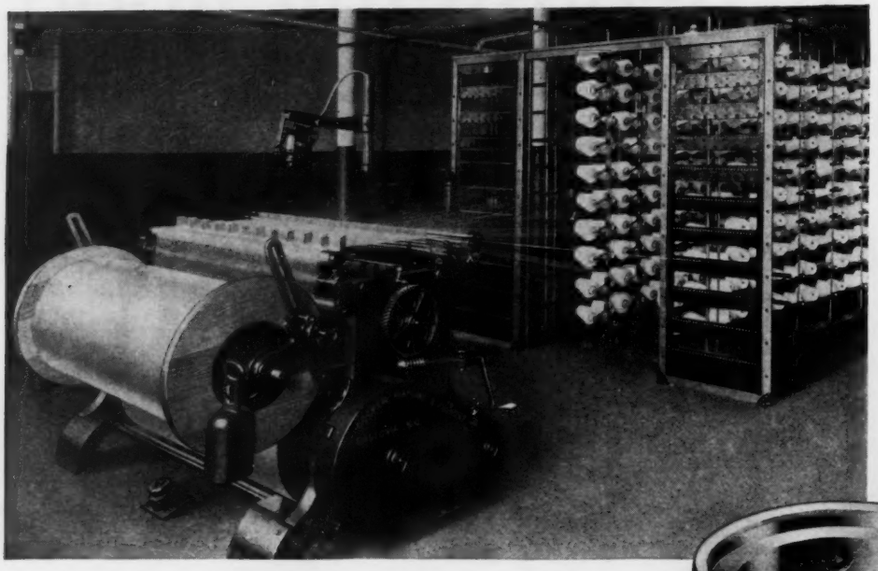
BOSTON, MASS. ATLANTA, GA.

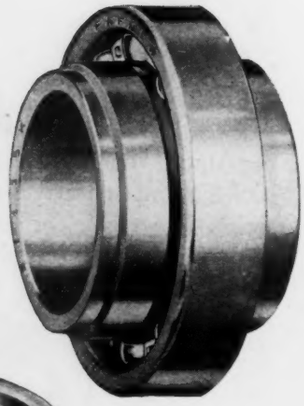
Established 1888

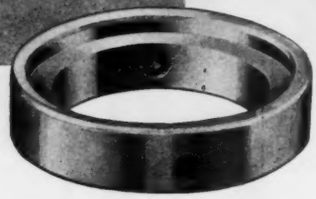
PROVIDENCE, RHODE ISLAND

CHARLOTTE, N. C. GREENVILLE, S. C.

Less Waste from uneven ends







. . . WITH Fafnirs

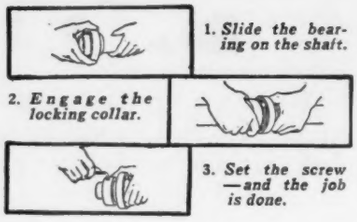
Warping speeds of today are triple those of yesterday, and ball bearings help make these speeds possible by practically eliminating friction. Mill owners and machine builders are reaping many advantages by Fafnirizing this new high-speed equipment—ease of application being only one distinctive Fafnir feature.

The cleanliness surrounding the mounting, due to well-designed housings and grease lubrication, is another important benefit to the mill operator. Because the bearings are so near the warps, such cleanliness is of greatest importance.

Fafnir Ball Bearings insure uniform speed and thus eliminate all variations in measurement and warp lengths.

The high-speed heavy duty warper shown, built by Cocker Machine & Foundry Company and typical of the high grade machines now in use, is in the words of the builder "constructed of high quality materials and built to a standard to carry on with no unnecessary stops for adjustments and repairs." Ably meeting the requirements, Fafnir Ball Bearings are used throughout.

Consult any Fafnir engineer to learn how these anti-friction bearings, from "the most complete line of ball bearings in America," can save power and reduce maintenance costs for *you*. THE FAFNIR BEARING COMPANY, *New Britain, Connecticut*. Representatives also at: Atlanta, Georgia . . . Houston, Texas . . . Charlotte, North Carolina . . . Boston, Massachusetts . . . Dallas, Texas . . . Birmingham, Alabama.

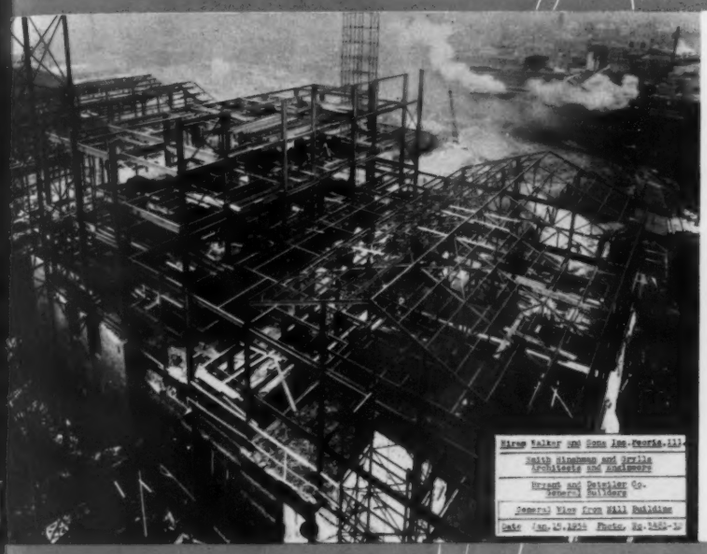


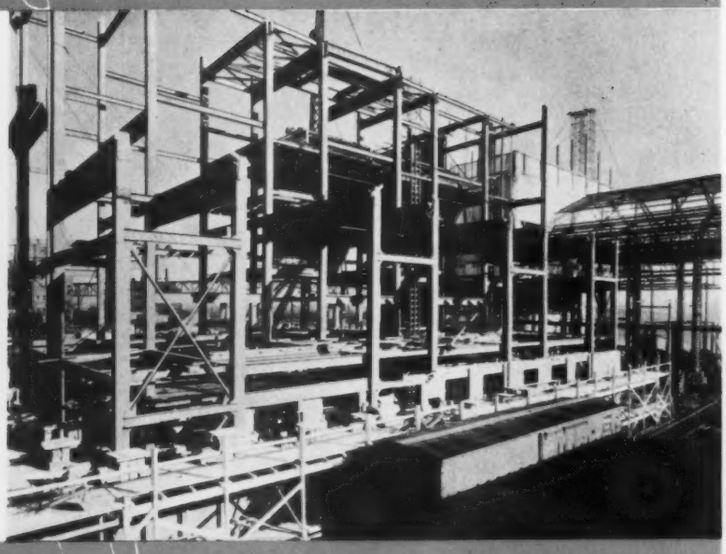
● *The Fafnir Wide Inner Ring Ball Bearing is outstanding in its simplicity of application.*

KEEP *abreast of new developments. Read Fafnir's house organ, "The Dragon." We will gladly put you on the mailing list.*

FAFNIR BALL BEARINGS

HIRAM WALKER





SHERWIN-WILLIAMS PAINTS
PROTECT WORLD'S LARGEST DISTILLERY

A plant covering 22 acres; a daily capacity of 100,000 gallons; a bottling capacity of 10,000 cases of quarts every 7-hour day. The structures required 4,000 tons of structural steel; the tanks 2,000 tons of plate steel. Much of the painting work was carried on under severe weather handicaps in the middle of the winter. Good paint—S-W Kromik Metal Primer and S-W Metalastic Field Coat—performed a big job that met with Hiram Walker's enthusiastic satisfaction. Sherwin-Williams Paint Engineering Service can do the same satisfactory work for you.

SHERWIN-WILLIAMS
KROMIK and METALASTIC

Kromik Metal Primer brushes easily and has excellent covering capacity, assuring an economical paint. It is formulated on a lead chromate base and is unexcelled in its power to inhibit corrosion. It has strong normal drying properties, and the film will stand a lot of abuse. (The film is resistant to moisture and gaseous penetration.) • Metalastic Field Coat contains a large percentage of graphite and carbon, and in all colors the pigments are balanced to produce a paint that brushes out correctly and forms a tight film. It is obtainable in brown, grey, green or black.

SEE THE SHERWIN-WILLIAMS PAINT ENGINEER

2065

SHERWIN-WILLIAMS PAINTS

METAL PROTECTIVE FINISHES

SHERWIN-WILLIAMS PAINTS

B. P. JOHN

PORTLAND, OREGON

B. P. John converts a log to a living room suite, all within one organization. This leading West Coast furniture manufacturer believes in complete control from raw materials to finished furniture. When purchasing finishes for wood products, they expect the supplier of these finishes to subject every ounce of material to thorough laboratory test.

That's just what B. P. John receives from Sherwin-Williams, and for that reason this high-grade furniture manufacturing concern purchases 100% of its finishing materials from us. Furthermore, its sales force stresses the fact that B. P. John uses Sherwin-Williams finishes exclusively—the best quality lacquers, stains and fillers obtainable. They also emphasize to their customers the extra value of finest quality finishes, backed by the wide experience of the Sherwin-Williams research and technical organization. This close coöperation has also led to definite production advantages—improved product quality, less finishing trouble, more dependable finishing schedules, while unit costs are well within an economical budget.

FREEMAN SHOE COMPANY

BELOIT, WISCONSIN

To the shoe industry goes credit for far-reaching, practical demonstrations of the value of color in plant maintenance and production. Four years ago, the Freeman Shoe Company in the Mid-West and the E. T. Wright Co. in the East, recolored all machinery in their respective plants. Both jobs were done at practically the same time, with neither company having any knowledge of the other's work. Both experiments have proved genuinely successful. The Freeman plant is a thrilling place to see and furnishes a remarkable example of ideal working conditions. Machines are in pastel green, blue, orange, cream, with some dangerous parts red. Eye strain has been lessened, and the whole plant is cleaner, more wholesome and more efficient as a result of this introduction of color. Furthermore, operators are more careful about keeping their machines in spic-and-span condition, assuring a minimum number of rejects. The machines are finished in S-W Lustral Enamel, and the colors and finish are standing up—as is expected of any Sherwin-Williams paint product.

MARTZ BUS

WILKES-BARRE, PA.

A few operating statistics of the Frank Martz Coach Co., largest independent bus system in America:

Parlor Cars	110
City Type Busses	55
Coal Trucks	20
Mileage (1934)	3,000,000
Passengers (1934)	8,000,000
Operation Hours (1934)	304,000

This means service, more service, and still more rough, tough service. Martz uses Sherwin-Williams Opex Lacquers and other automotive finishes for every job in its garages. These finishes prove their superiority in rain, snow, dust, sleet and heat—and prove it by showing longer life and fewer refinishing jobs. Sherwin-Williams engineers are lowering unit costs from hairpins to busses, toys to trains.

KOOL CIGARETTES

ATLANTIC CITY

The Kool Penguins come skiing through the air above the boardwalk at Atlantic City—their electrical silhouettes vividly contrasted against the black of the night. To make that contrast as great as possible, S-W Kem Bulletin White is used to reflect the radiance of electric bulbs. Throughout the country, the brighter, more durable S-W Kem Bulletin Colors decorate thousands of bulletins of America's largest advertisers.

TOBACCO PLANTS

Conditions within a tobacco plant are more than enough to try the patience of any paint. Tobacco fumes have a high ammonia content that leads to quick yellowing on the part of most mill whites. And, since high humidity is always necessary in the manufacturing process, cold weather causes a maximum amount of condensation. At times, water actually runs in streams from windows onto window ledges and wall surfaces. Add to these the constant possibility of mildew and fungi, the impossibility of painting except in perfect weather, and you have a big painting problem.

Save-Lite, because of the wide experience of Sherwin-Williams engineers, is an excellent tobacco industry paint. Here is a typical industry where special formulation is necessary—where the mill white must be made to fit the job. General Cigar Co., one of the largest operators in the industry, standardizes on Save-Lite as the best paint for its problems.

ERWIN COTTON MILLS

ERWIN, N. C.

Sherwin-Williams has always been famous for exterior house paints. So naturally many large textile mills turn to us for help in keeping the homes of their employees in the best of shape. Here are some of the excellent homes erected by the Erwin Cotton Mills, protected and beautified with Sherwin-Williams Paint.

Sherwin-Williams Paint serves the textile industry's special needs and assures the long life so necessary to low costs. Don't overlook the fact that what applies to plant interiors also applies to mill village property. Well painted homes are big aids to better morale and better work.

THE SHERWIN-WILLIAMS CO.

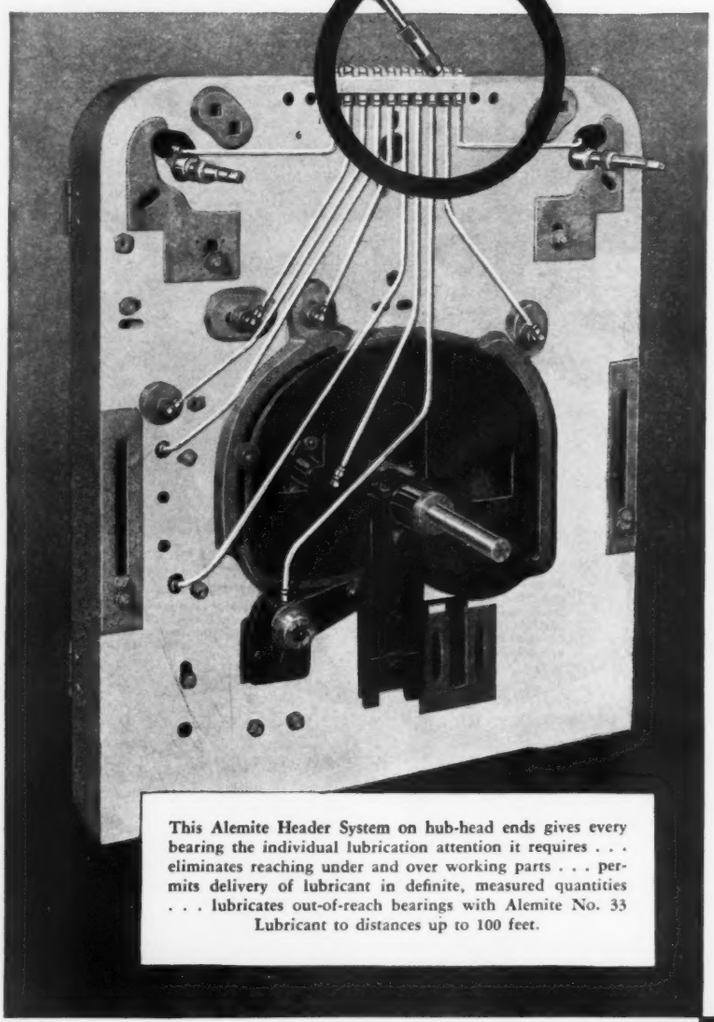
Administration Offices: CLEVELAND, OHIO • Sales offices, factories and warehouses in principal cities

World's Largest Manufacturer of Paints, Varnishes, Lacquers, Enamels and Stains

QUICK, CLEAN WAY TO LUBRICATE HEAD END GEARINGS ON SPINNING, TWISTING, AND ROVING FRAMES

Alemite Centralized Header System Eliminates Daily Oiling

Lubricating ten bearings without getting near moving machinery.



This Alemite Header System on hub-head ends gives every bearing the individual lubrication attention it requires . . . eliminates reaching under and over working parts . . . permits delivery of lubricant in definite, measured quantities . . . lubricates out-of-reach bearings with Alemite No. 33 Lubricant to distances up to 100 feet.

CUTS COSTS—PROTECTS FINISHED PRODUCT

It's no longer necessary to put up with gummy, lint-filled oil holes or messy cups to keep your frames in working order. This simple, centralized Alemite Header System reduces a daily oiling job to a quick, clean operation that is necessary *only once every seven to ten days.*

It cuts labor costs and eliminates the dangers of oiling machinery in operation. It greatly reduces the contamination of the finished product, especially when Alemite Solidified Lubricant is used, completely eliminating oil drippage.

Many textile machinery manufacturers are equipping their machines with Alemite Systems. So include this clean, convenient Alemite Centralized Header System in your specifications.

Why not let us send an Alemite Lubrication Engineer to help you analyse *your* lubrication requirements? You are not obligated in any way, and he'll make free recommendations that will save you money on labor, lubricant and repairs. Many mills have accepted this offer and are now slashing maintenance costs by modernizing their machines with Alemite. Just drop a line on your letterhead to:

ALEMITE CORPORATION
(Division of Stewart-Warner Corp'n.)
1884 Diversey Parkway Chicago, Illinois
Stewart-Warner-Alemite Corporation of Canada, Ltd., Belleville, Ontario, Canada

ALEMITE
REG. U. S. PAT. OFF.
Controlled Application of the Correct Lubricant

★ ★ ★

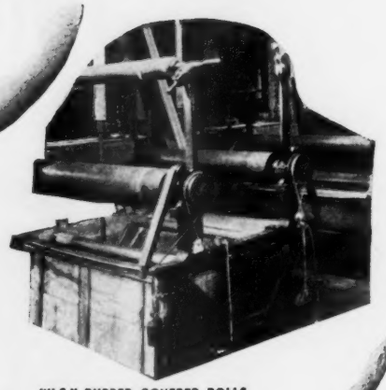
This man is cutting costs in hundreds of mills and can do it for you.

U.S. RUBBER

IN THE TEXTILE INDUSTRY SINCE 1846

"U.S." has specialized in mechanical rubber equipment for the textile industry since 1846—and has always served the industry with products that reflect this experience in better performance and longer life.

UNITED STATES RUBBER PRODUCTS, INC.
1790 Broadway New York, N. Y



"U.S." RUBBER COVERED ROLLS

"U.S." Washer Rolls, Padder Rolls, Starch Mangle Rolls, Dye Jig Rolls and Squeeze Rolls are standard equipment in many of the leading textile mills of the country.

"U.S." RUBBER TANK LINING

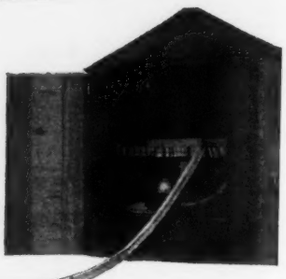
For use in the storage of Bleach, Acids or Corrosive Materials, "U.S." Rubber Tank and Pipe Linings give satisfactory service.

"U.S." AIR HOSE

For cleaning spinning frames, there is no better, no more longer lasting or more easily handled air hose made than "U.S." Rainbow.

"U.S." RAINBOW SHEET PACKING

Pack one joint or flange in your plant with "U.S." Rainbow; but be sure it's Rainbow. Unless it bears the name Rainbow it isn't genuine.

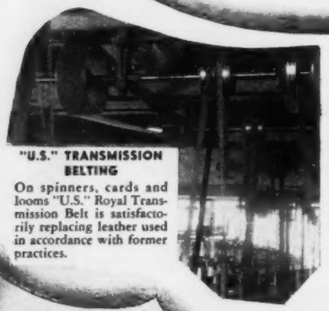


"U.S." FIRE HOSE

"U.S." Security Mill Hose is made with the highest quality calendered rubber tube and long-fibre cotton woven fabric, protected chemically against mildew and rot.

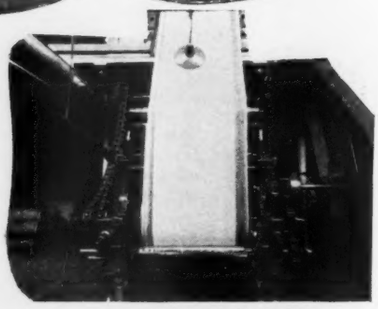
"U.S." WIRES AND CABLES

A complete line of wires and cables. "U.S." Royal Portable Cord for every type of portable electrical equipment . . . extremely flexible, non-absorbent, highly abrasion-resistant.



"U.S." TRANSMISSION BELTING

On spinners, cards and looms "U.S." Royal Transmission Belt is satisfactorily replacing leather used in accordance with former practices.

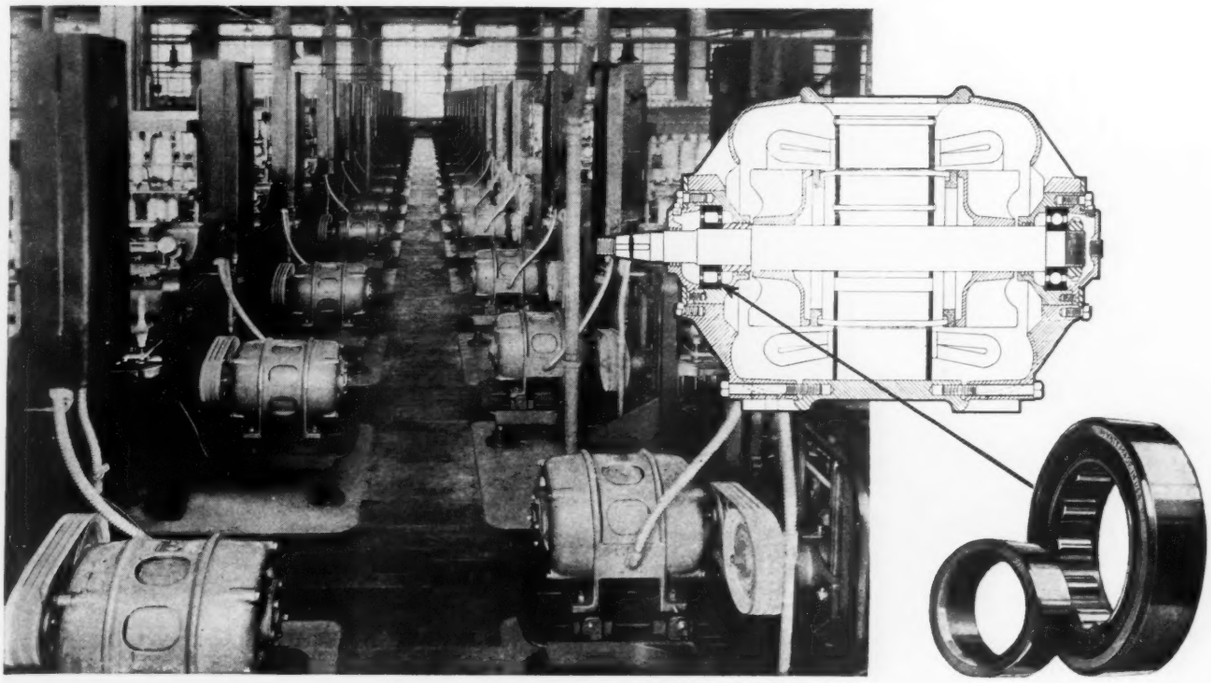


"U.S." RUBBER BLANKETS

"U.S." Mackintosh Blankets, with smooth joint, eliminate seam marks—an outstanding success in textile printing of difficult, fine patterns.

UNITED STATES RUBBER COMPANY US TRADE MARK

United States Rubber Company



On this battery of motors built by DIEHL MANUFACTURING COMPANY, ELIZABETHPORT, N. J., Hyatt Roller Bearings are used on the shaft extension end and ball bearings on the closed end. An ideal bearing arrangement as the sectionalized motor view shows. The new Hyatt HY-LOAD Solid Roller Radial Bearing is also illustrated.

LONGER LIVED ELECTRIC MOTORS —WITH HYATTS

Many years ago Hyatt proved that ROLLER bearings give the textile industry better and longer bearing service.

Positive evidence is to be found in the thousands of Hyatt Roller Bearings successfully operating in pickers, cards, drawing frames, slashers, spinning frames, looms, and all types of finishing machinery.

Now a new Hyatt Roller Bearing designed to give increased carrying capacity in a minimum of space is adding years of bearing life to the extension or overhung end of motor armature shafts.

SPECIFY HYATTS
For Your
ELECTRIC MOTORS
They Cost No More

This is of particular value in the case of short center V belt motor drives, as illustrated in a large Southern thread mill, where trouble at the pulley end with sleeve bearings was completely overcome with Hyatts. Ask your supplier to quote on Hyatt-equipped motors or write us for further details. Hyatt Roller Bearing Company, P. O. Box 476, Newark, New Jersey.

HYATT

ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

When a man signs his name

● On a recent visit of 700 contractors to the Crane CORWITH Works, Chicago, amazement was expressed on all sides at the elaborate system of inspection, gauging and testing which controlled the manufacture of every elbow, tee, union, nipple, valve and faucet.

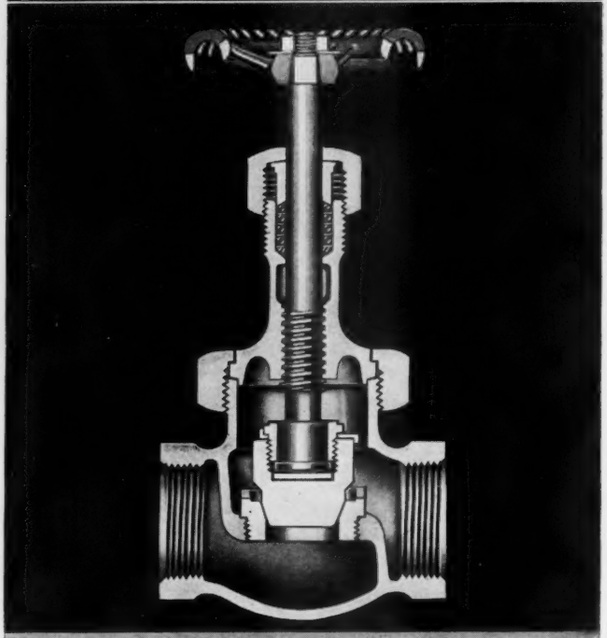
When a man signs his name, he is laying bare his character for the whole world to see and to appraise. When Crane Co. sends even a 1/4" nipple out of the factory, that nipple must be a flawless product, a symbol of its maker's integrity. On this principle every Crane product and service is made and sold.

Your steam and water lines fabricated with Crane products, you have an integrated piping system whose dependability and long life is guaranteed by the character of Crane manufacture and Crane Co. responsibility.

With stocks in all leading cities, and a service organization equipped and eager to serve every industrial need, Crane Co. suggests that you enlist its aid in bringing your plant up to the profit-level of efficiency and reduced maintenance cost.

CRANE SHOP FABRICATION SERVICE
Design Flanging
Casting Cutting
Bending Threading
Welding Assembling
There is a Crane Valve or Fitting for every piping requirement

RUGGED



CRANE NO. 212-P BRASS PLUG DISC GLOBE VALVE

1 A rugged valve for severe service—rated for 250 pounds steam pressure at 500° Fahrenheit.

2 Scientifically designed plug type disc for throttling service.

3 Width and angle of seating surface gives long service life but does not restrict flow or permit disc to wedge in seat.

4 The Crane nickel alloy disc and stainless steel renewable seat add greatly to service life of valve.

5 Stem thread parts made of metals selected for their ability to resist wear.

CRANE VALVES, FITTINGS and PIPE FABRICATION

CRANE CO., GENERAL OFFICES: 836 SO. MICHIGAN AVE., CHICAGO, ILL. • NEW YORK 23 W. 44TH STREET

Branches and Sales Offices in One Hundred and Sixty Cities

FREE ON REQUEST

REEVES presents a new reference book on variable speed control—the most complete and helpful book on this subject ever published.

Handy in size and serviceably bound in blue cloth stamped in gold, this new Handbook contains 112 pages and more than 200 illustrations.

Regardless of the type of product you manufacture, this Handbook will be of interest and value to you. It gets right down to the brass tacks of variable speed control—what it is—how it is engineered and applied—and the remarkable advantages it offers. This book is written out of the experience of REEVES engineers in applying infinite speed adjustability to more than 75,000 machines and in assisting over 1100 machine builders to incorporate speed control as standard equipment.

Every production executive, purchasing agent, machine designer and plant superintendent should have a copy. Since this book is being distributed free only to those who request it, we suggest that you fill out and mail the convenient coupon at right.

REEVES VARIABLE SPEED TRANSMISSION

Many NEW FEATURES in this Handbook

Here are a few of many new features that make it important for you to have this Handbook:

- The requirements of modern speed control equipment—a valuable check list to use in selecting the most efficient methods and units.
- Description and pictorial presentation of the complete line of REEVES Speed Control Equipment—designs, controls, speed ratios, sizes—developed to meet the specific requirements of hundreds of machines and manufacturing processes.
- H. P. ratings and speeds stepped up on REEVES Variable Speed Transmissions, providing greater capacity per unit.
- Hydraumatic Control—a new hydraulic automatic control of high sensitivity and positiveness operating from extremely slight indicating movement.
- Improved endless cord V-belt giving greater strength and capacity, longer life, to this vital part.
- New type frame construction enabling easier installation or removal of V-belt and other operating parts.
- Improved electric remote and automatic controls with more compact mounting of control equipment.
- Force-feed lubrication system on open design REEVES Transmissions.
- Complete data on the REEVES Vari-Speed Motor Pulley, the efficient, simplified unit for direct installation on motor shaft.
- Engineering data in convenient form for reference—tables for selecting correct size and class (speed range) of REEVES Transmission for any machine application. Complete dimension diagrams of various REEVES designs, efficiency charts, etc.

USE THIS HANDY COUPON

REEVES PULLEY COMPANY
Columbus, Indiana

Please send FREE copy of your new Speed Control Handbook T-35.

Name .....

Title .....

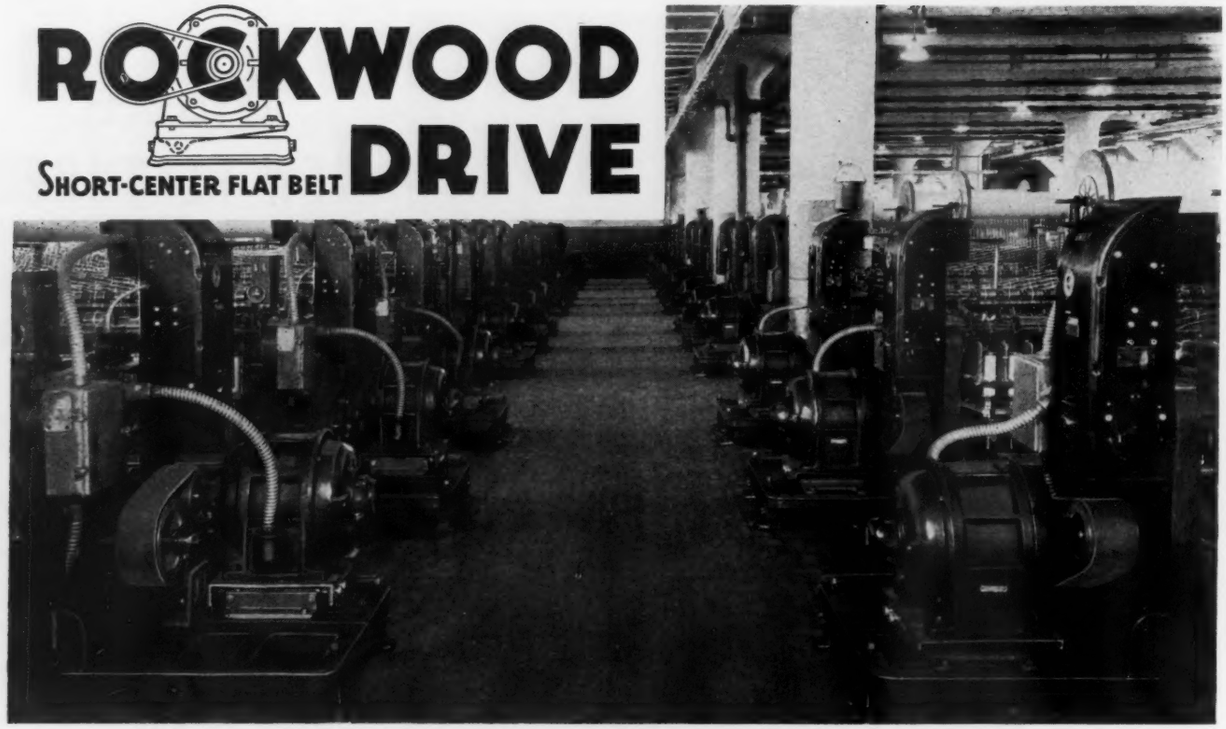
Company .....

Street .....

City ..... *State* .....

ROCKWOOD DRIVE

SHORT-CENTER FLAT BELT

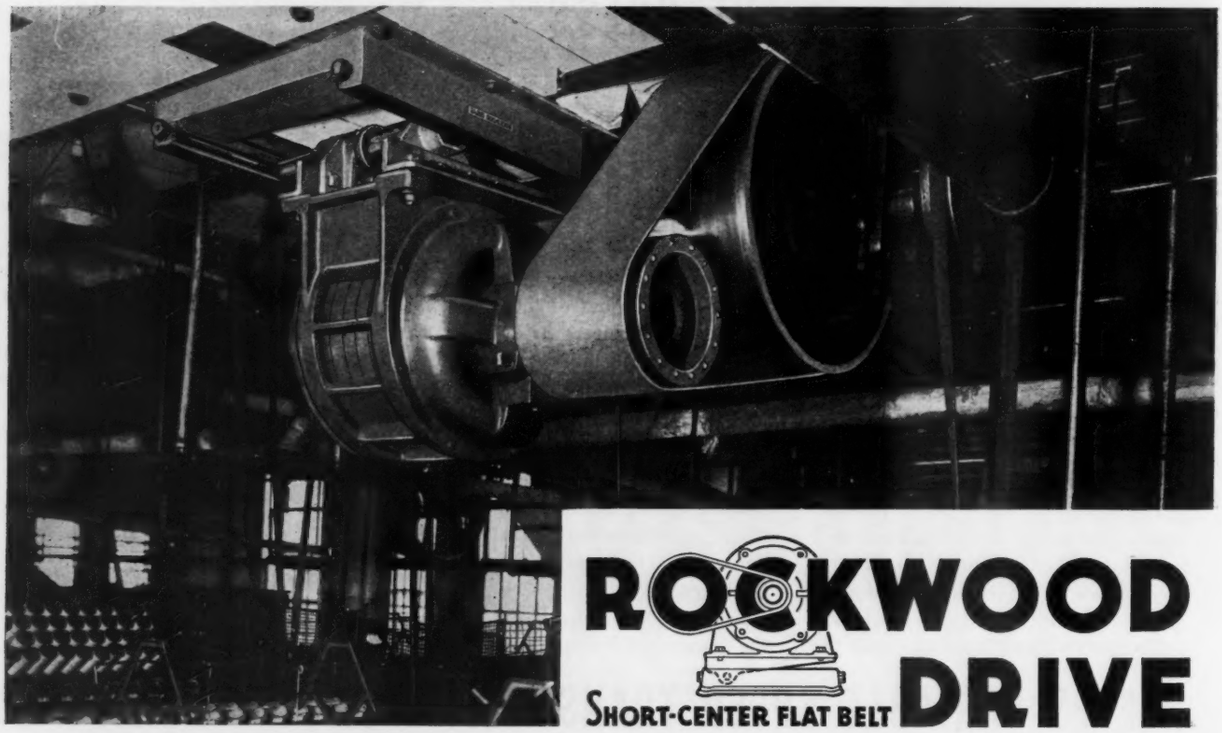


ROCKWOOD Drives on Beam Twisters at Winnsboro Mills, Winnsboro, S. C.

ROCKWOOD Drives are proving their superiority in thousands of textile mill installations. Smoother transmission of power—increased machine output—enduring dependability in service—because belt tension is automatically controlled. . . . Before you change any drives in your mill, get complete facts. ROCKWOOD engineers will be glad to work with you.

THE ROCKWOOD MANUFACTURING CO.
Division of General Fibre Products, Inc.
INDIANAPOLIS, INDIANA

A compact 100 H. P. ROCKWOOD Ceiling Drive to lineshaft in a silk mill.



ROCKWOOD DRIVE

SHORT-CENTER FLAT BELT

A FINE FABRIC Sells Itself!

Learn a lesson from the woman shopper who is "just looking around." When a beautiful fabric crosses her gaze, she stops—she inspects . . . and if it passes her critical judgment . . . she BUYS.

To turn "shoppers" into buyers . . . IMPROVE THE FINISH on your goods. Make sure they have clear, even shades—clean, sharp prints—soft, rich feel and appearance.

ONYX . . . for a fine finish!

For a "finish that sells", turn to ONYX . . . **specialists on finishing materials.** Every ONYX compound is developed with an eye on the finished goods. Each operation becomes a step toward a fine-finished fabric.

Leading dyers, printers and finishers use ONYX compounds because they produce finer fabrics . . . give efficient mill performance . . . and have absolute uniformity. These benefits extend to all fabrics—silk, rayon, hosiery, cotton, wool and mixtures.

Write for a trained representative to call with facts and proof of ONYX superiority in processing and finishing. Let him demonstrate the advantages in your own mill. Samples on request. WRITE TODAY.

GIVE YOUR FABRICS A FINISH THAT Sells!

ONYX OIL & CHEMICAL CO.

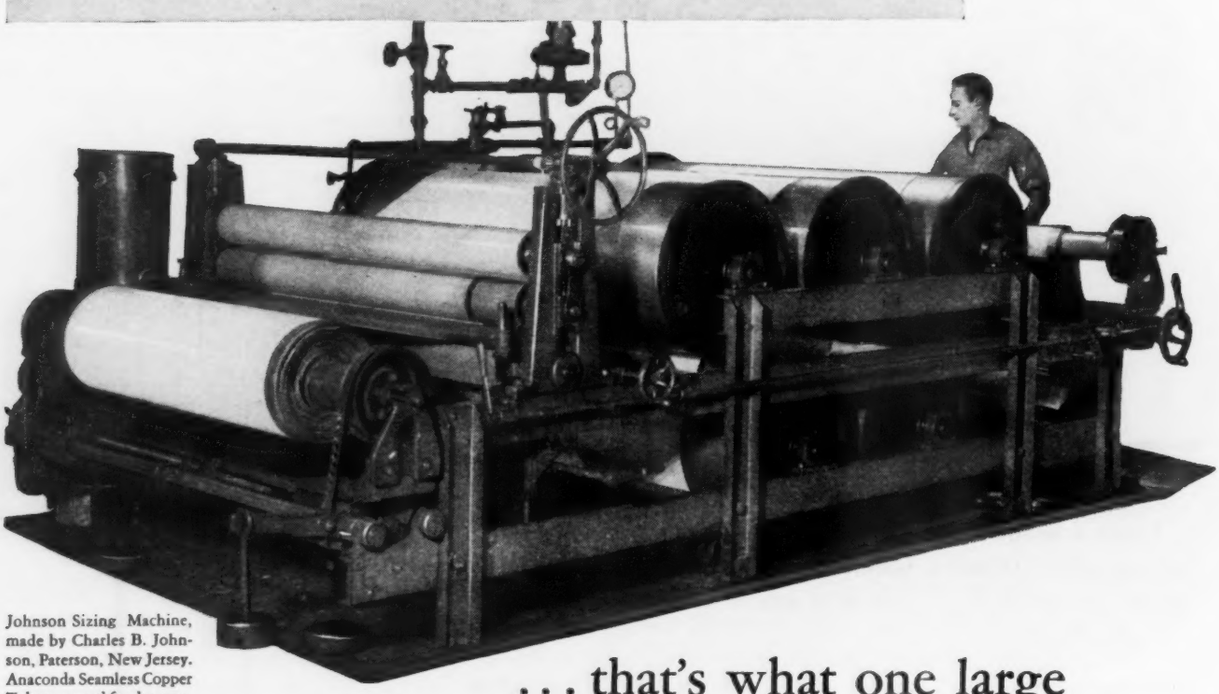
Specialists on Finishing Materials.

Jersey City, N. J.

Southern Repr. E. W. Klumph, Charlotte, N. C.
Midw. Repr. Maher Color & Chemical Co., Inc., Chicago.
In Canada: Onyx Oil & Chemical Co., Ltd., Montreal.

Onyx LABORATORY-CONTROLLED **PROCESSING & FINISHING COMPOUNDS**

"Superior to brazed cylinders... smoother, stronger, more symmetric"



Johnson Sizing Machine, made by Charles B. Johnson, Paterson, New Jersey. Anaconda Seamless Copper Tubes are used for dry cans.

... that's what one large user says about

Seamless DRY CANS

Charles B. Johnson, experienced manufacturer of textile machinery, is well qualified to make this significant statement about the superiority of dry cans made of Seamless Anaconda Copper Tubes:

"We have found that Seamless Copper Drying Cylinders are superior to the brazed cylinders and that they are smoother, stronger, more symmetric and concentric."

To which we add this one thought: That commercial production of large seamless tubes up to 26" in diameter, *by special mill equipment of The American Brass Company,* provides the textile industry with this superior material for the construction of better quality dry cans... at no increase in cost.

Textile companies and equipment manufacturers are invited to communicate with us for specific information on their requirements. In addition, our Technical Department is prepared to consult with engineers on all problems pertaining to the use of copper and its many serviceable alloys in the textile industry.

35197

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Offices and Agencies in Principal Cities
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario

ANACONDA
From mine to consumer

ANACONDA COPPER & BRASS

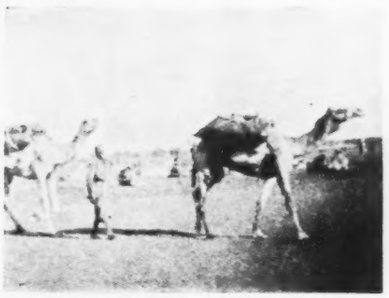
The Story of Gum Arabic

1. Tear of Gum Arabic.

2. Wild Gum Trees (Acacia Verek).

3. Tapping the Tree; the bark is loosened and stripped off.

4. Collecting the Gum.



5. Loaded Camels entering market at El Obeid.

6. Scene in Gum Market, El Obeid.

7. Resacking purchased gum from Arabs' Sacks (Skin).

8. Cleaning Gum for Shipping.

9. On Sudan Government Railways, en route for Port Sudan.

10. Steamer at Port Sudan en route for world's markets.

Arabic, Karaya and Tragacanth Gums—supplied from our large stocks in all grades, in any form, type or quality, and for every purpose.

● We have been importing and milling gums for over 20 years and can supply you with gums from stock, undiluted, unblended in the original import packages, or milled to your own specifications.

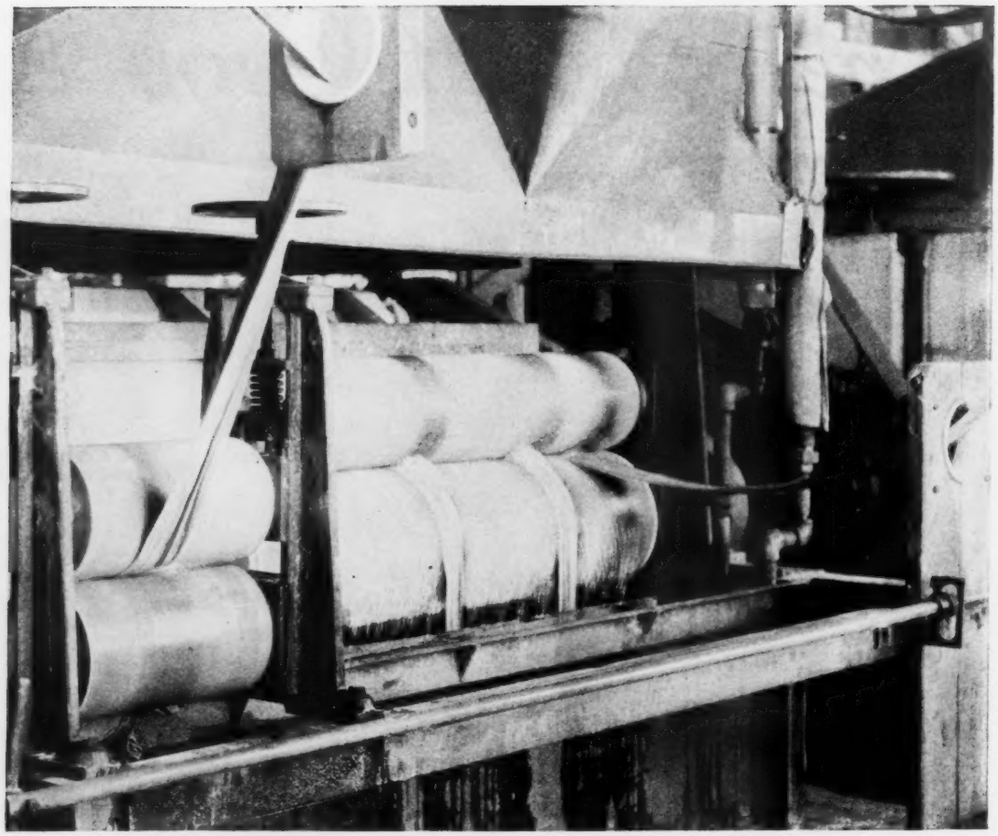
Write us today of your special requirements or send us samples of gums you now use and we will match with counter samples and submit quotations.

PHOTOGRAPHS COURTESY OF OXFORD UNIVERSITY PRESS AND WELLCOME TROPICAL LABORATORIES.

JACQUES WOLF & CO.

MANUFACTURING CHEMISTS AND IMPORTERS . . . PASSAIC, NEW JERSEY

Warehouses: **Providence, R. I., Philadelphia, Pa., Utica, N.Y., Chicago, Ill., Greenville, S. C., Chattanooga, Tenn.**



A Soap Manufactured Under Controlled Production Assures Uniform Soaping

In the soaping down of vat colors in the finishing of cotton fabrics—a soap of *uniformly* fine quality is a necessity. Only a soap manufactured under controlled conditions may be used safely.

Flint Brand Shredded Soap is Guaranteed, 88% Real Soap. Also in powdered form 92% Real Soap.

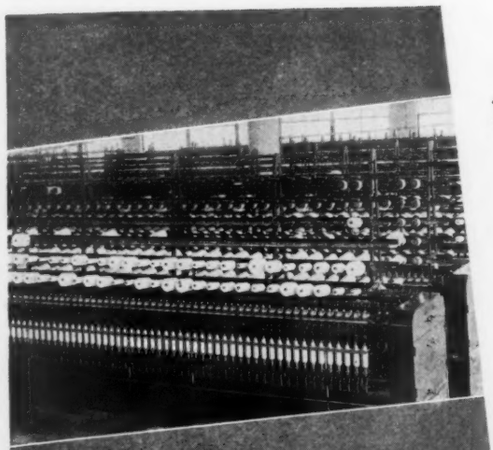
Armour's Flint Brand Soap has been a favorite in cotton finishing plants for years because strict laboratory control gives absolute assurance of uniformity—barrel for barrel, year in and year out. Flint Soap is a high titre soap that can be depended upon at any temperature—and gives long lasting, economical suds.

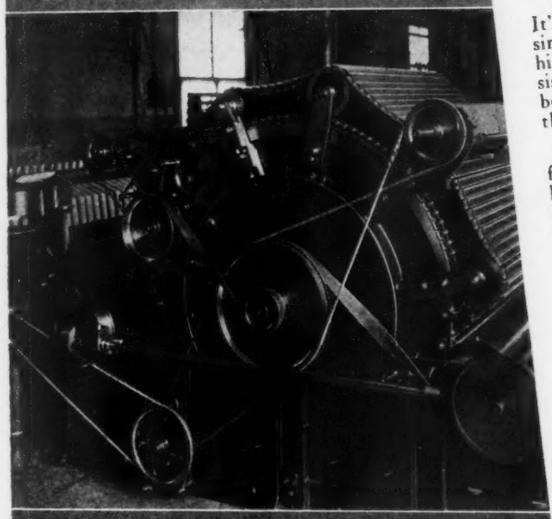
If you are not now enjoying the many advantages Flint offers, why not order a test barrel to prove our claims? Flint comes in shredded (88% real soap) or powder (92% real soap) form. Your written request will bring you prices and terms—without obligation of course!

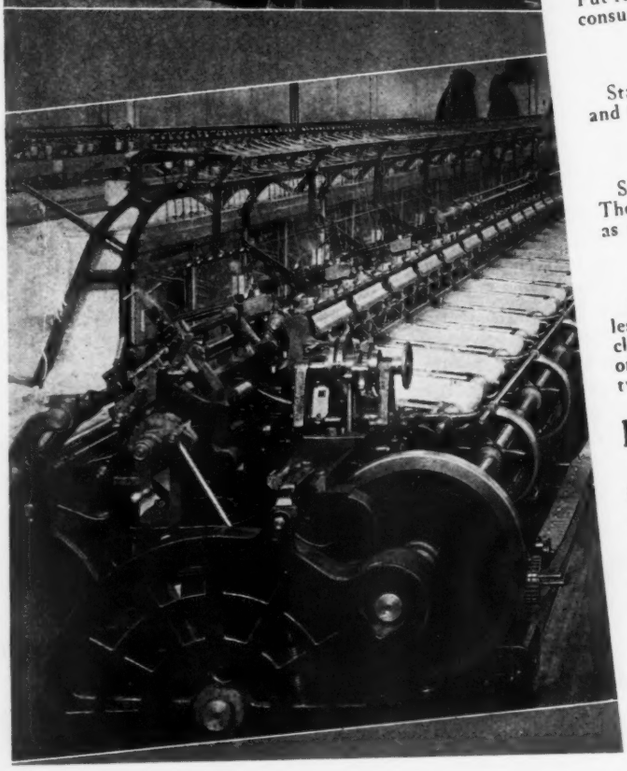
INDUSTRIAL SOAP DEPARTMENT

ARMOUR AND COMPANY

1355 W. 31st STREET • CHICAGO, ILLINOIS







OIL
½ AS OFTEN
USE
½ AS MUCH
with
STA-PUT
LUBRICANTS

This is not a claim or prediction. It's based on actual performance, since Sta-Put Lubricants with their high film strength, extreme leak resistance and greater lubricity have been "on duty" in textile mills over the country.

Below are some extracts from performance reports that prove our headline. Remember, too, that Houghton has other special textile lubricants for needles, spindles, twister rings, compressors—and for processing, too.

SILK LOOMS

"We now oil once where we formerly oiled twice, and each time we now use only half as much oil. Drip eliminated."

QUILLERS

On plain babbitted bearings Sta-Put reduced oiling labor cost and oil consumption 50%.

BATT CARDS

Sta-Put saved 50% on lubricant and labor; did not splatter.

COMB BOXES

Sta-Put replaced a fluid grease. They now oil half as often; use 2/3 as much oil as before.

KNITTING MACHINES

Five months' record shows 50% less oil used than before, less seepage, cleaner machines, and no gumminess on dials. Oil once a day instead of twice daily.

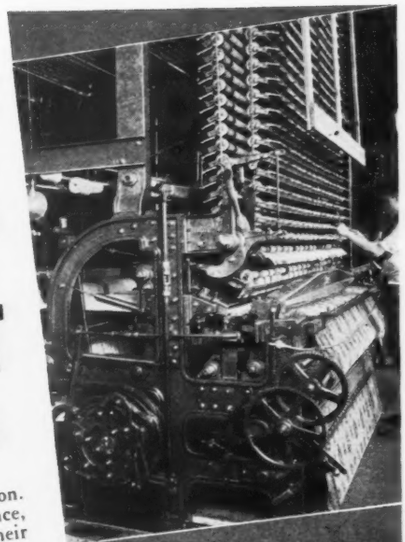
E. F. HOUGHTON & CO.
Established 1865
Chicago-PHILADELPHIA-Detroit

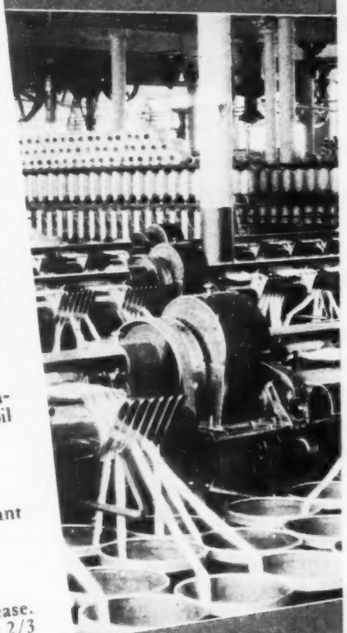
Send the coupon below to 240 W. Somerset St., Philadelphia, for Folder 2-466 describing Sta-Put.

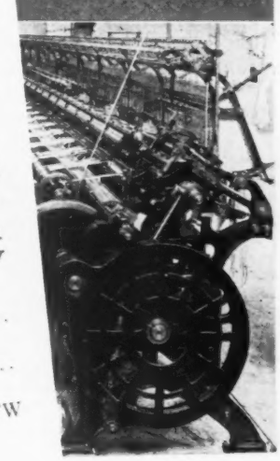
Name .....

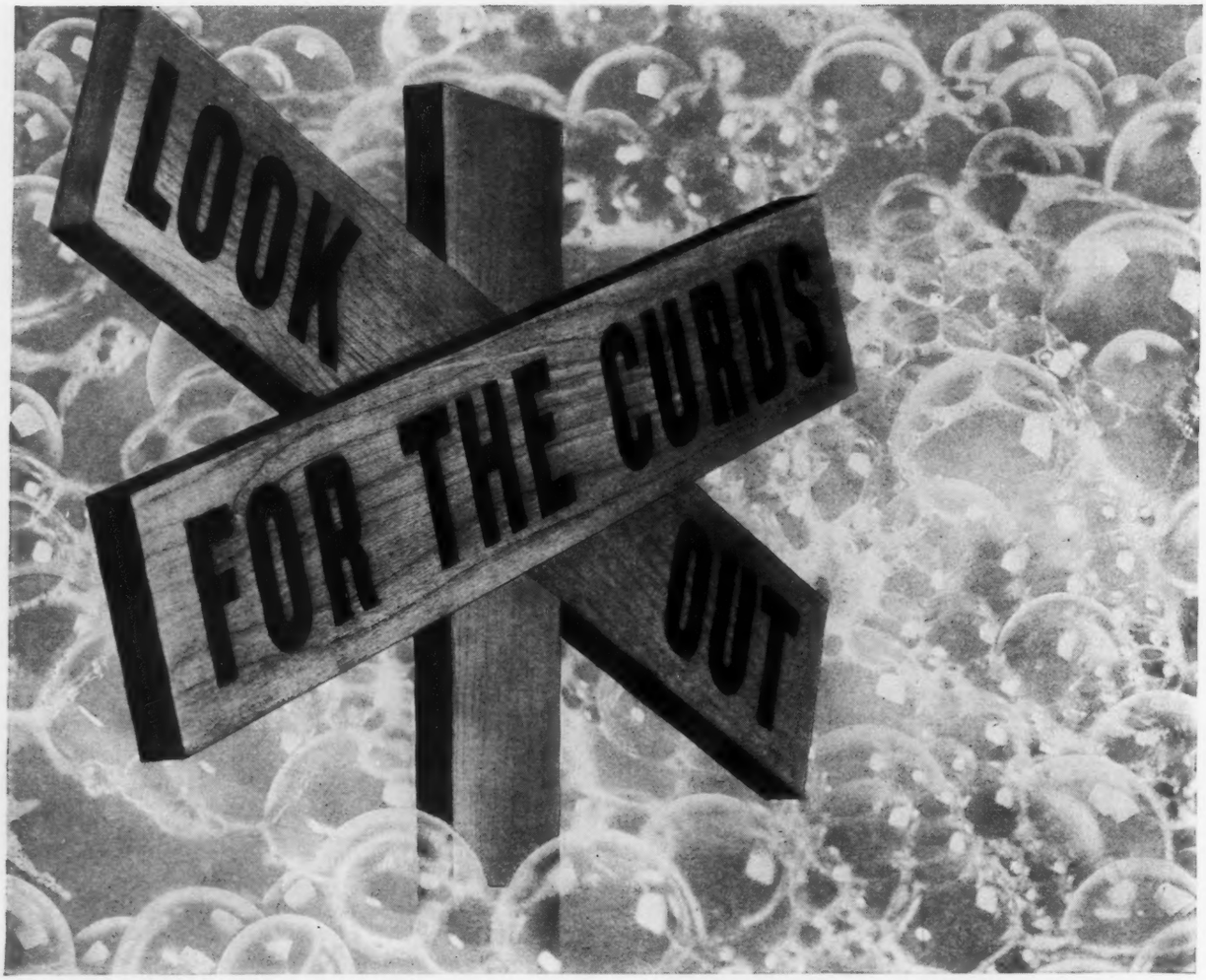
Company .....

Address ..... TW









● Soap and water are all-important for wool scouring, silk degumming, and cotton boiling-off. But where there's suds, look out for curds!

Wherever water comes in contact with soap in textile wet-processing, it is essential that the water be free from calcium and magnesium salts to avoid the formation of insoluble soap curds. Curds coat the tiny fibres of wool, silk, and cotton . . . make them stiff and harsh, and unevenly absorbent to dye. A lower quality fabric is the result.

Your supply water . . . when made absolutely clean, soft, and colorless . . . helps you to produce uniformly high quality goods. Textile experts will tell you that practically *all* mill water supplies must be properly filtered or softened, or perhaps even further treated to enable finished goods of high quality to be produced.

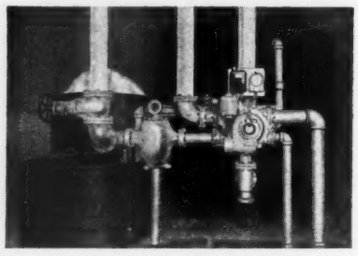
Do you know that more than 1,000 textile mills are now using Permutit Water Conditioning Equipment? Immediate benefits have been gained. There are fewer re-runs and rejections. Soap, soda, and bleach are saved. Boiler tube repairs and replacements are reduced to a minimum. And there is less yarn breakage.

More important, finished goods are softer and smoother . . . and have an even, full-bodied color.

Such equipment saves enough to pay for itself in two years . . . sometimes in a single year!

Why not write for our free booklet, "Reducing Textile Costs and Troubles"? You'll find it a valuable handbook of information. Write The Permutit Company, 330 West 42nd Street, New York.

Permutit
Water Conditioning Equipment



Modernize your old equipment. Install Permutit's new single-valve automatic control, and refill your softener with Super-Zeo-Dur. This new greensand zeolite has been recently perfected . . . it uses less salt, and has 75% higher capacity for softening water than ever before. Write for details.

PREVENT *wrinkled sheets* AT THE CALENDER...

...WITH THE *Taylor* PRESS ROLL LOAD RECORDER

This Taylor Pressroll Load Recorder shows on its chart uniform or varying pressures at the ends of the calender rolls by means of two pen readings. The arrow shows one end of the roll where the pressure is constantly being indicated.

Announcing a new application of a Recording Thermometer in finishing plants

A COTTON MILL found an easy and economical way to guard against spoiled sheets at the range finishing calenders. And with a Taylor Press Roll Recorder it took another step to assure finished goods of uniformly fine quality.

The Taylor Recorder writes an accurate, hour-by-hour chart record of pressures at both ends of the calender roll. It shows whether uniform pressure is being maintained . . . whether there is constant tension across the sheet as it goes through. It enables the operator to prevent slackness on one side of the sheet causing crinkle marks.

This new Taylor Instrument application pays for itself quickly. Besides helping to maintain sheet quality, it eliminates uneven frictional wear on rolls and lengthens their life.

Here is only one of many ways Taylor Instruments and Control Systems can save textile mills money and maintain uniform high quality. Taylor Engineers will help you with any temperature or pressure control problem in *your* mill from Slashing to Finishing, as they have done in many others.

For complete information on the Pressroll Load Recorder and any modern application of temperature or pressure control, write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. Manufacturers in Great Britain—Short & Mason, Ltd., London.

Taylor

Indicating | Recording • Controlling

TEMPERATURE, PRESSURE *and* **FLOW INSTRUMENTS**

CUT COSTS FROM SLASHING TO FINISHING

3
MONEL METAL FACTS

...for the mill that makes its own repairs and replacements!

Most textile men know that Monel Metal is the standard corrosion-resistant material for dye-house equipment, that it can't rust, and outwears and out-saves other materials that are considered for this service. What is sometimes *not* understood is that Monel Metal is easy to fabricate, and that supplies are easily and quickly obtainable:

1 ***Monel Metal is carried in stock***—at convenient delivery points in all the commonly used mill forms: sheets, rods, tubing, welding wire, and such accessories as screws, nuts, bolts, washers and rivets. Monel Metal castings are available from well equipped foundries. (Items not in stock are available with but little delay from mill shipment.)

2 ***Latest information about working Monel Metal*** is readily available in the form of printed instructions and bulletins. They are clearly written and well illustrated, and show how Monel Metal is machined, formed, polished, coiled, soldered, brazed and welded electrically or by gas. Welded Monel Metal equipment does not require annealing to insure its corrosion resistance.

3 ***Monel Metal stocks are carried by*** the following suppliers who also handle rolled Nickel and Nickel-Clad Steel:

Atlanta
J. M. TULL METAL & SUPPLY CO.
285 Marietta Street

Boston
WHITEHEAD METAL PRODUCTS CO. OF NEW YORK, INC.
235 Bridge Street, Cambridge, Mass.

Buffalo
WHITEHEAD METAL PRODUCTS CO. OF NEW YORK, INC.
319 Niagara Street

Chicago
STEEL SALES CORPORATION
129 South Jefferson Street

Cincinnati
WILLIAMS AND COMPANY, INC.
2118 Spring Grove Avenue

Cleveland
WILLIAMS AND COMPANY, INC.
1748-56 East 22nd Street

Denver
HENDRIE & BOLTHOFF MFG. & SUPPLY CO.
1621-39 Seventeenth Street

Detroit
STEEL SALES CORPORATION
4150 St. James Street

Kansas City
STEEL SALES CORPORATION
606 West 59th Terrace

Los Angeles
PACIFIC METALS COMPANY, LTD.
1400 South Alameda Street

Milwaukee
STEEL SALES CORPORATION
647 West Virginia Street

Minneapolis
STEEL SALES CORPORATION
529 South 7th Street

Newark
WHITEHEAD METAL PRODUCTS CO. OF NEW YORK, INC.
215 Frelinghuysen Avenue

New Orleans
EQUITABLE EQUIPMENT CO., INC.
410 Camp Street

New York
WHITEHEAD METAL PRODUCTS CO. OF NEW YORK, INC.
304 Hudson Street
Bronx Office: 1334 Webster Avenue, Bronx

Philadelphia
WHITEHEAD METAL PRODUCTS CO. OF NEW YORK, INC.
725 Arch Street

Pittsburgh
WILLIAMS AND COMPANY, INC.
901 Pennsylvania Avenue

St. Louis
STEEL SALES CORPORATION
4903 Delmar Boulevard

San Francisco
PACIFIC METALS COMPANY, LTD.
3100 19th Street

Seattle
EAGLE METALS COMPANY
21 Spokane Street

Montreal
ROBERT W. BARTRAM, LTD.
277 Duke Street

Toronto
PECKOVER'S LIMITED
77 Front Street, E.

Vancouver, B. C.
WILKINSON COMPANY, LTD.
190 Second Avenue, West

• • •

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

IF YOU SANFORIZE...USE THIS OIL

NOPCO 60 FINISHING OIL

A finishing oil providing all the excellent qualities of the regular line of Nopco finishes—but formulated especially to meet the demands of the Sanforizing process.

DOES NOT DISCOLOR—DEVELOPS NO ODOR

Nopco 60 finishing oil is resistant to oxidation, thus assuring two important features in the Sanforizing of materials: complete freedom from discoloration, and the absence of odors.

ASSURES QUICK WETTING-OUT — BETTER FIBRE SETTING

The readiness with which Nopco 60 finish wets out makes it ideal as an aid to uniform shrinkage during tentering — and assures proper lubrication.

PROVIDES A SMOOTH EVEN FINISH

The superior wetting features of Nopco 60 —together with its better lubricating qualities—combine to provide a smoother, even-er finish, thus improving the appearance and quality of the finished material.

CAN BE EASILY TESTED

A sample of Nopco finishing oil will be sent upon request enabling you to test its qualities in your own mill. Mail the coupon below for sample, data sheets and technical information.

NATIONAL OIL PRODUCTS COMPANY
Harrison, N. J.

Boston Chicago San Francisco

NOPCO

National Oil Products Company
Harrison, N. J.

(Send for this sample of Nopco 60 today.)

Gentlemen: Please send me a sample of Nopco 60 finishing oil for Sanforizing, and complete data and technical information.

Name _____ Company _____

Address _____ C-9

A Wealth of it "Made" Him
A Lack of it Destroyed Him

With the *co-operation* of his colleagues, Julius Caesar rose to the pinnacle of Roman power, but when these same colleagues felt that Caesar had grown too self-sufficient, they ceased to co-operate and stabbed him to death on the fatal Ides of March. No man is greater than his ability to obtain and use the cooperation of his fellows.

In the modern struggle for business supremacy, cooperation, or group action, is often the difference between success and failure. This is particularly true, where textile chemistry is involved, because the subject is so big and so complex, and changing so rapidly, that no one man can know it all.

CHEMICALS

Sizing and Finishing Gums and Compounds • Soluble Gums • Softeners • Soluble Oils • Tallow • Waxes • Soaps • Flour • Dextrines • Starches • Pigment Colors and Lakes • Ammonia • Acids • Blue Vitriol • Borax • Bichromate of Soda • Bichromate of Potash • Liquid Chlorine • Chloride of Lime • Caustic Soda (solid and flaked)

To assist the trade in meeting this ever present problem, this company offers a consultation service. This service is rendered, free of charge, by a staff of specially trained chemists, assisted by a completely equipped laboratory and a company experience of 120 years.

Use this service not only for new processing problems, but also to check up on the efficiency of routine methods. Write, or our representative will call, if you prefer.

Arnold, Hoffman & Co., Inc.

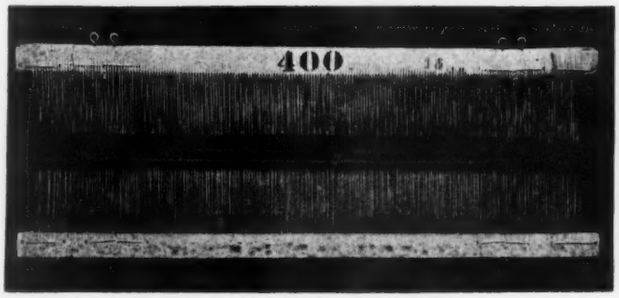
Established 1815. Plant at Dighton, Mass.

PROVIDENCE, R. I.

New York • Philadelphia • Boston • Charlotte

EMMONS *Advanced Loom Equipment News*

Harness Cuts Repair and Renewal Costs



This is the harness, Chafeless Cord, that is cutting repair and renewal costs to a minimum in mills both North and South. Here is what a mill superintendent wrote about the Performance of these improved harnesses with the Warp-Saving Finish:

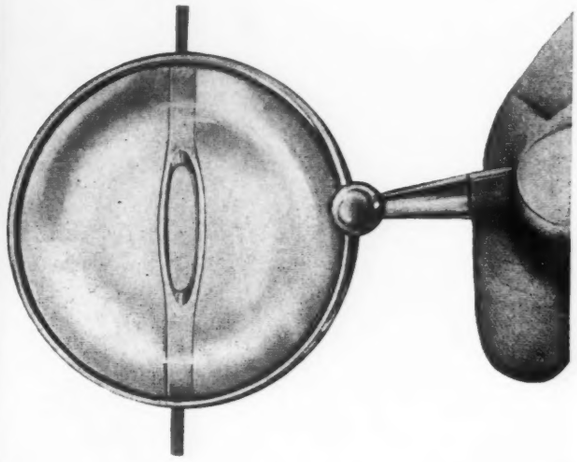
"We ran 500 sets day and night for two full years and did not lose a single set—an exceptionally good record. **There were practically no repairs.** The smoothness of this harness and its freedom from chafing of the warp have been an important factor in continuous production."

Loom stoppage due to warp breaks can be signally diminished by the Super-Smoothness of Chafeless Cord Harness.

Here's the REED *for* BETTER WEAVING

To every mill seeking ways to get more first-grade cloth, fewer rejects and seconds due to reed marks, and increased yardage per loom, Emmons Pitch Band Reed offers these positive advantages:

Multiplied Air Space, up to 65% if you require it—**Super-Smoothness of Dents** and **Built-In Accuracy** that gives freedom from reedy cloth. Equip a section with these Advanced Reeds and note the difference in performance.



See the Smoothness of this EMMONS STEEL HEDDLE—*magnified 3 times*

It takes sixty (60) separate polishing operations to bring the inside of the eye of the Emmons CHAFELESS Steel Heddle to this glass-like Super-Smooth Finish. But this smoothness means a lot in production—in reduction of warp breaks especially. Try these Emmons Steel Heddles and see what an advance they are—with Smoothness you can actually SEE.

Also a Complete Line of:

Non-Slip Mail Eye Harness, All Metal Reeds, A'l-Metal Block and Leice Reeds, Selvage Harness, Wardwell Loop & Doll Pickers, Slasher and Striking Combs, Jacquard Heddles, Mending Eyes and Twine, Wire Heddles and Heddle Frames—in fact, almost ANYTHING in the way of Loom Equipment. Just order it from Emmons Loom Harness Company.

EMMONS LOOM HARNESS CO.

Lawrence, Mass.

CHALLENGER

GIVES BETTER TRANSMISSION

★Challenger Square Edge Belting has established the highest standard of transmission efficiency based on the experience of all types of plants and under all conditions. For high speed or heavy duty service, it meets the most exacting requirements for strength, flexibility, minimum slippage, low permanent stretch and long life. Year in and year out it gives dependable power-saving performance and keeps manufacturing operations running smoothly. Challenger is stocked by well known distributors at all important centers.

THE REPUBLIC RUBBER CO.

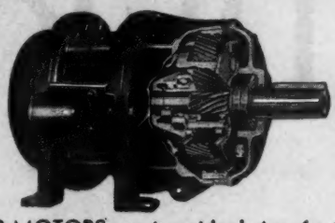
YOUNGSTOWN, OHIO

Mechanical Rubber Products for Every Industrial Requirement

ORDER REPUBLIC RUBBER PRODUCTS FROM YOUR DISTRIBUTOR

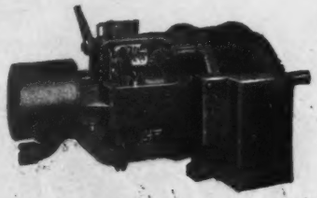
Tailor-made for finishing plants

WHICH MOTOR DO YOU NEED ?



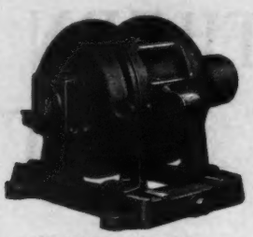
GEAR-MOTORS permit a wide choice of speeds from 600 down to 11 rpm. Available in single-phase, polyphase, and direct-current ratings, there is a G-E gear-motor for virtually every low-speed drive

DIRECT-CURRENT ADJUSTABLE- AND CONSTANT-SPEED MOTORS are available for a wide variety of heavy-duty applications



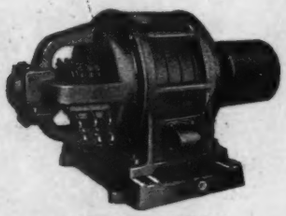
BTA BRUSH-SHIFTING MOTORS, manufactured exclusively by General Electric, offer wide ranges of speed and easy speed adjustment

TOTALLY ENCLOSED, FAN-COOLED MOTORS are recommended for use in severe moisture conditions. They are effectively cooled through the use of external-fan ventilation



SQUIRREL-CAGE INDUCTION MOTORS— simple, sturdy motors for your general-purpose applications

SPLASHPROOF MOTORS are designed for use where there are splashing or dripping liquids



WOUND-ROTOR INDUCTION MOTORS provide an economical means of adjusting speeds, over a limited range, for loads that do not have pronounced torque fluctuations

DRIVES FOR ALL FINISHING MACHINES

EVERY finishing-plant requirement has been taken into account in the construction of these motors. There are types for all finishing uses—drives that will reduce your operating and replacement costs and give many years of trouble-free performance.

MOTORS FOR ALL FINISHING USES—with calenders, tentering ranges, soapers, mercerizers, mangles, dryers, printing machines, padders, dyeing machines, Sanforizers.

The savings these economical, dependable motors will enable you to effect are the result of scientific design, and years of research in General Electric laboratories. The nearest G-E office will be glad to supply further information; or, write General Electric, Schenectady, N. Y.

011-63

GENERAL ELECTRIC

Labels
ALL KINDS

Tickets
AS USED ON BLANKETS

Hang Tags
Bolt Ends
Stickers
FOR IDENTIFICATION AND CONSTRUCTION SPECIFICATIONS

Riders
Box Tops
FOR HOSIERY

Bands
FOR ALL BOLT GOODS HOSIERY OR SHIRTS

These are

SALES BUILDERS

For
SOUTHERN TEXTILES

NEW DESIGNS · REPRODUCTIONS

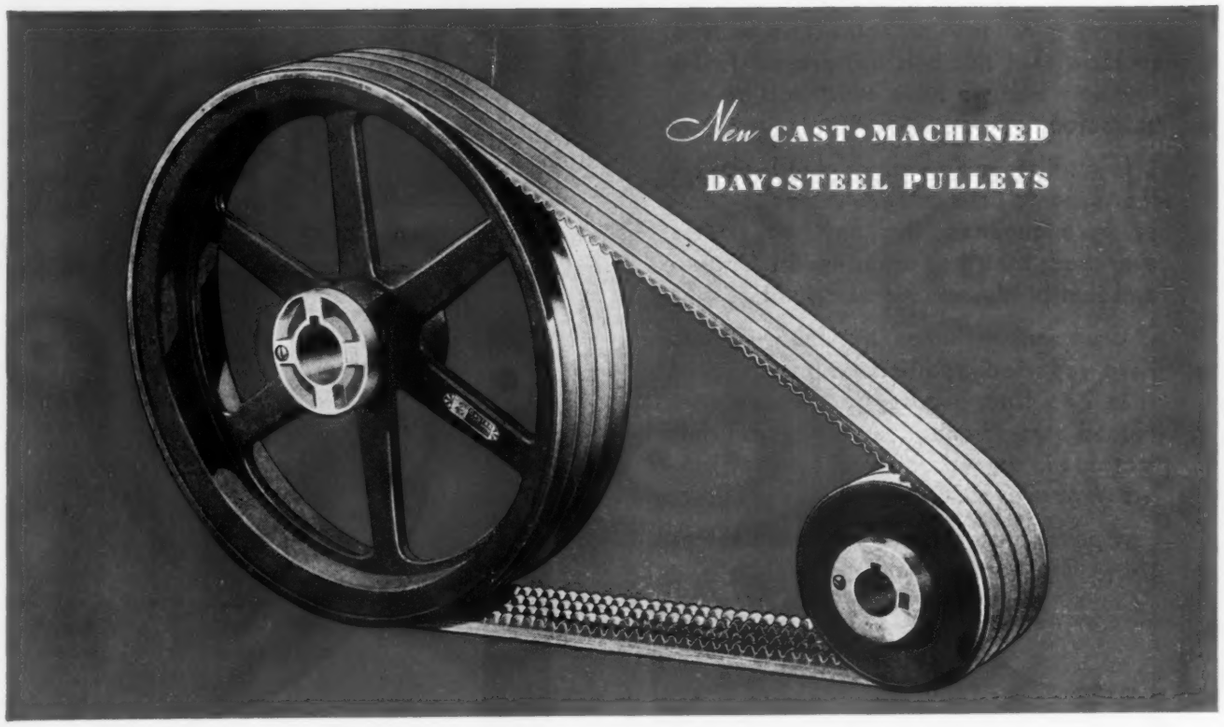
JACOBS GRAPHIC ARTS COMPANY
CLINTON · S.C.

Announcing

Dayton Cog-Belt Drives

with

New Day-Steel Pulleys



The new scientifically designed Day-Steel Pulleys used in conjunction with the famous Dayton Cog-Belts provide new economies in both original installation and maintenance costs.

These new Day-Steel Pulleys are of cast-machined (semi-steel) construction. The castings are so formed as to give maximum strength with the elimination of all excess metal, thereby providing pulleys of approximately the same weight as the pressed steel type.

All finished surfaces are machined to the accurate limits of precision work, the special semi-steel providing an exceptionally smooth and close-grained groove surface. All pulleys are accurately balanced to insure a true-running drive throughout. A high quality finish provides complete protection and gives a most outstanding appearance.

Stocks Quickly Available

Complete stocks are now available in all leading industrial centers.

Let us give you all the facts about Day-Steel Pulleys and Dayton Cog-Belt Drives—and the economy they will provide for you. Write for new and simplified catalog 110-C.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

World's Largest Manufacturers of V-Belts

Manufacturers also of Dayton Fan Belts, Dayton Red Tube Radiator Hose and the famous Dayton Thorobred Tires and Tubes

Dayton

COG-BELT DRIVES • DAY-STEEL PULLEYS

RHOADS TANNATE LEATHER BELTING

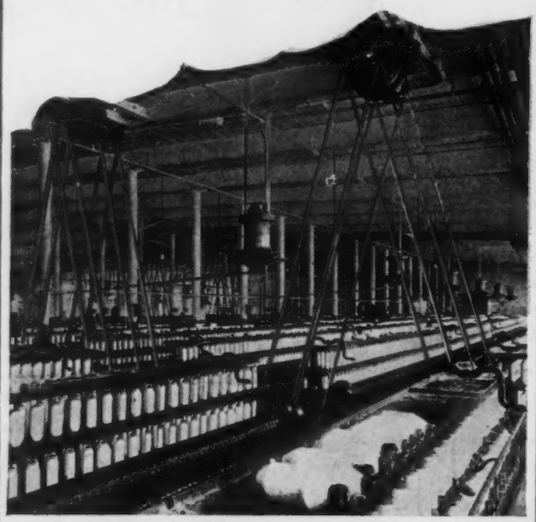
INCREASES OUTPUT IN TEXTILE MILLS

A textile company referring to a Tannate Belt purchased six years previously, said, "We would like for you to express to us at once 21 feet of the same type of belting, 6 inches wide. You will be pleased to know that this belt has proved to be the best belt we have ever used on our extractor."

In another mill, a superintendent says that Tannate Belts on cone-drives of winders have longer life than any belts he has ever used; that they never need taking-up and that production increased noticeably.

On spinning frames, a number of mills have reported additional turns of front rolls, 2 to 4 per minute, when Tannate replaced other belting. A very worthwhile increase in daily production as many buyers have proved.

It pays to use Rhoads Tannate Leather Belts. *They are dependable.*



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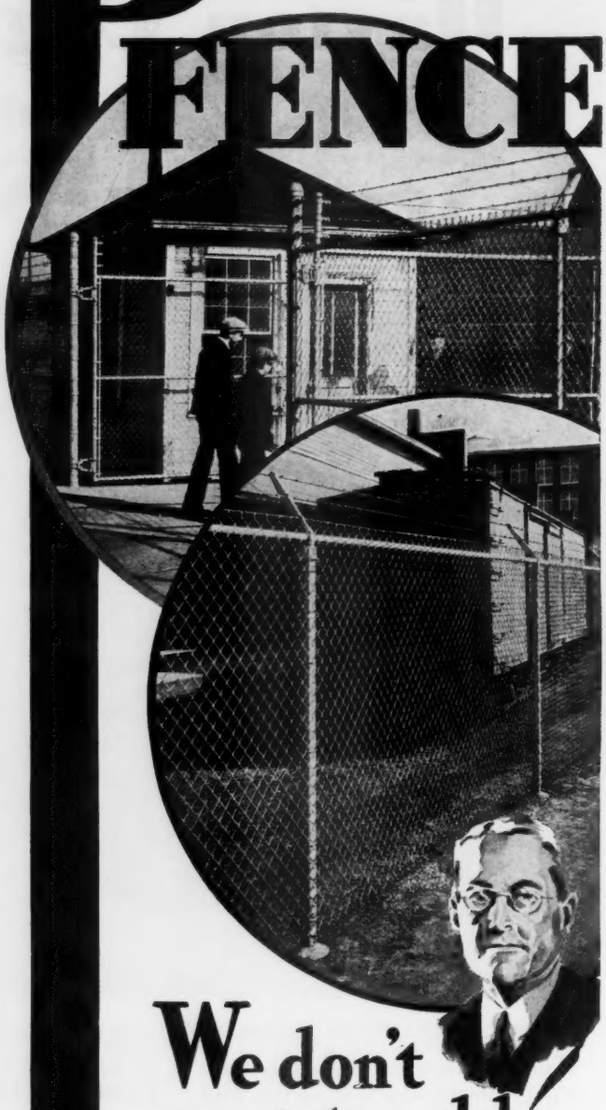

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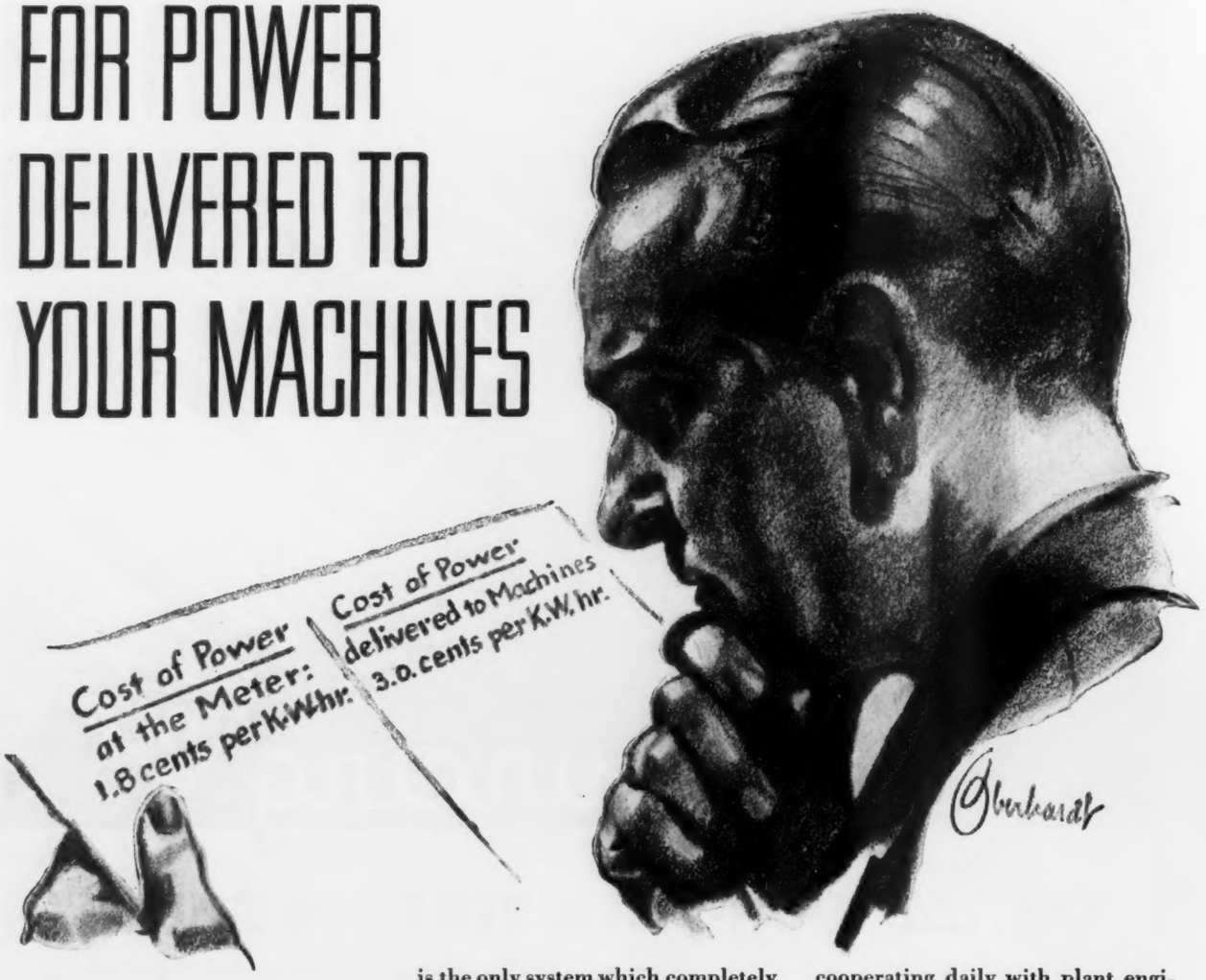

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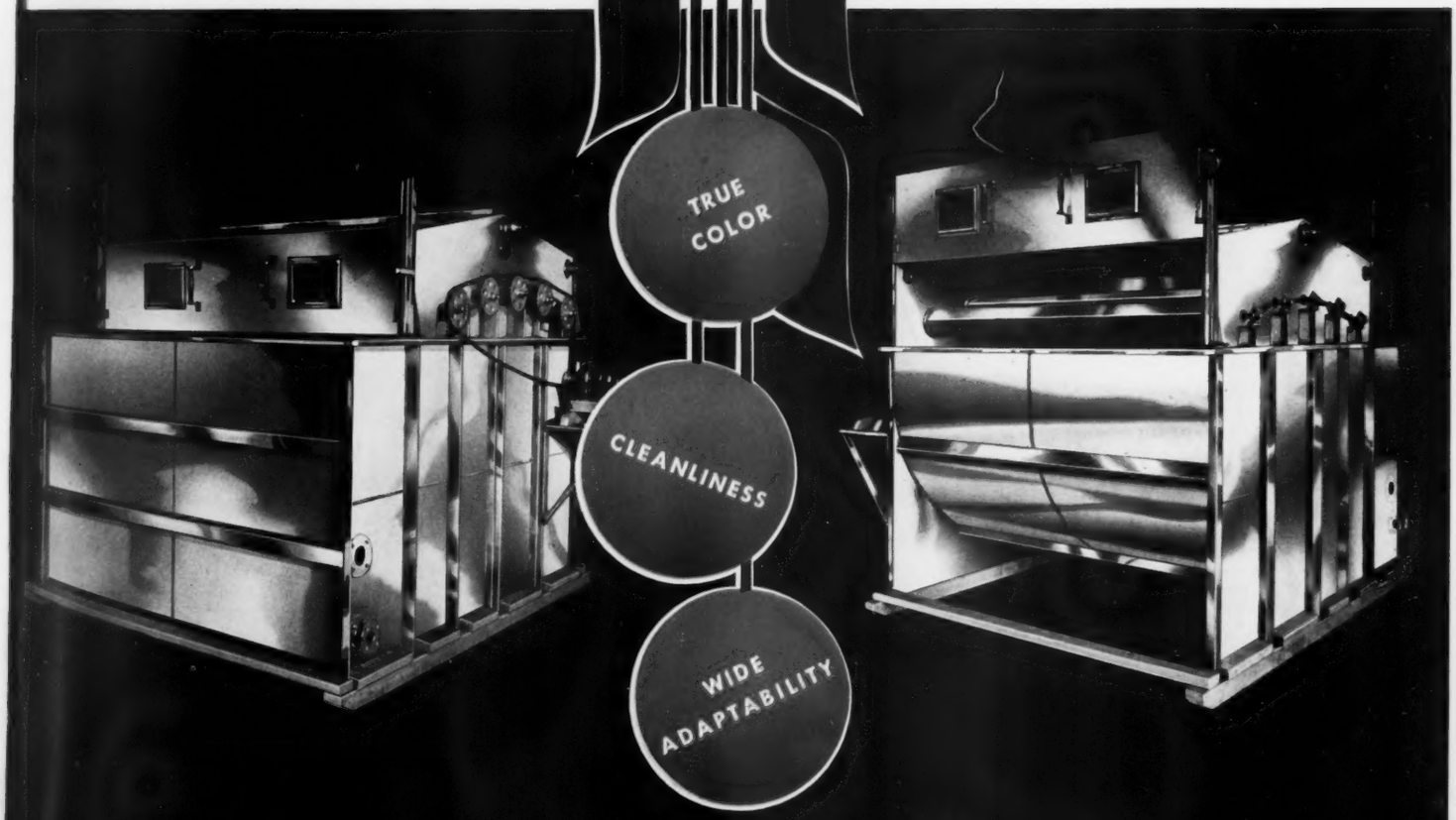
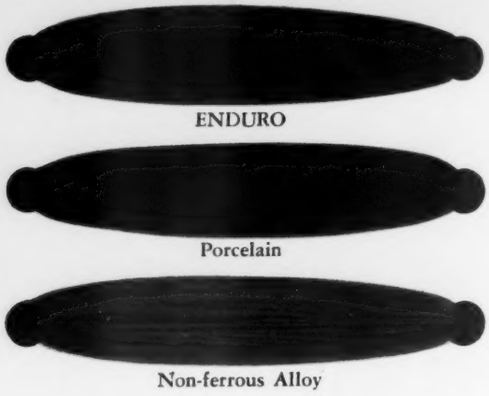


DYE KETTLES MANUFACTURED FROM STAINLESS ENDURO • • • SEE FOLLOWING PAGE

REPUBLIC ENDURO

1% CALCOCHROME BROWN RA—101 (C. I.)



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Non-ferrous Alloy

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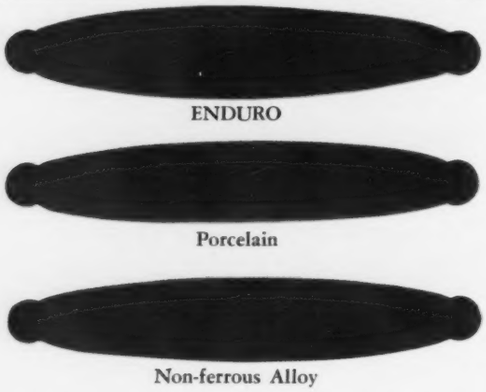
1% CALCOCHROME BLUE BLACK CONC.—202 (C. I.)

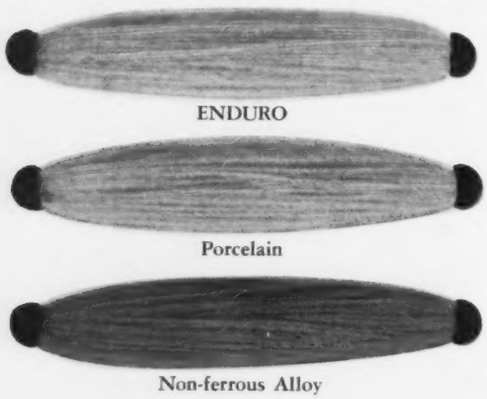


ENDURO

Porcelain

Non-ferrous Alloy

1% CALCOCID YELLOW M. C. G.—640 (C. I.)

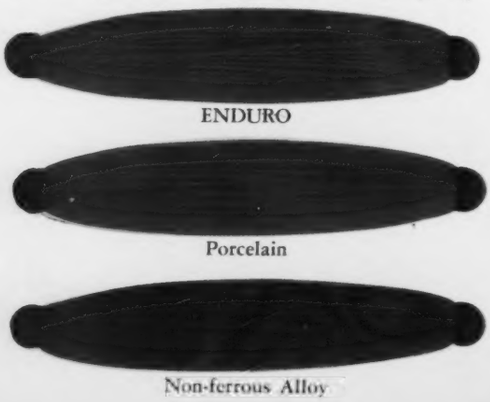


ENDURO

Porcelain

Non-ferrous Alloy

1% CALCOCID SCARLET MOON—252 (C. I.)



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Porcelain

Non-ferrous Alloy

Until recently, metal equipment in the Textile Industry has always presented hazards to the dyer and finisher. The solutions used in processing have usually corroded the metal to a degree requiring constant replacement. In many cases, the metal has reacted with the solutions either as a catalyst or directly, thus producing corrosive products or chemical changes in the solutions and thereby rejections and reprocessing of fabrics, due to "off shades."

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The comparative dye tests on this page show sample dyeings using acid and acid chrome colors in porcelain beakers with ENDURO and non-ferrous alloy inserts. Note that ENDURO holds the true color of the porcelain dyeing.

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Editor

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A Topical Cross-Index of the articles published in COTTON during 1934 (Volume 98) is available upon request to readers who have a complete file of the magazine for that year. Due to a limited supply of copies, we cannot promise to supply copies of any of the issues of the magazine published during that year . . . . . .

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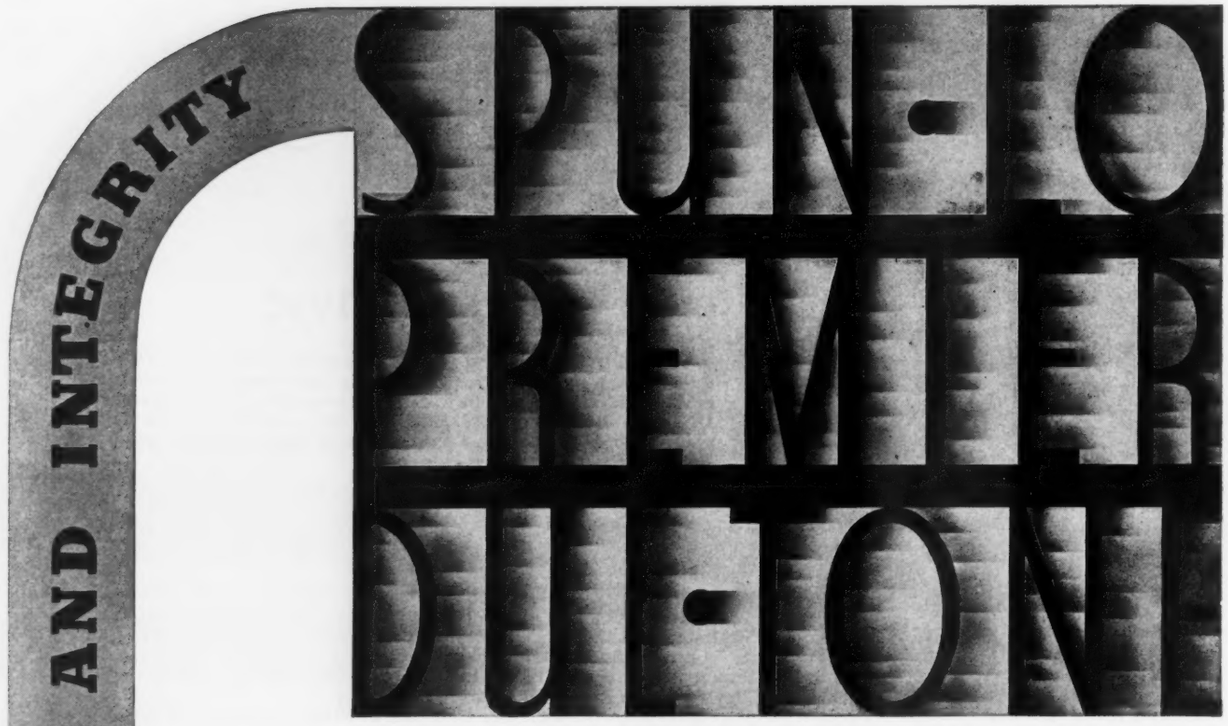

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Vol. 99
No. 9

COTTON

September,
1935

Processing Tax and Other Legislative Developments During August

August 28, 1935

THE textile scene was vitally affected by much of the national legislation adopted by the Congress in its session which concluded as this issue of COTTON *went to press . . . The processing tax, under the amendments to the AAA and the suits for injunction and recovery, together with the provisions made by many mills to provide for the complications in the event of its invalidation, continued to occupy the spot light of textile interest . . . Here is a comprehensive review of August developments on the tax, as detailed as space will permit, and as up-to-date as is practical.*

Brief mention is given also of other national developments, with comment from a textile standpoint. . . . It is hoped to present more detailed analysis of the Wagner labor relations bill and the social security legislation, as they affect textile manufacturing, in the next issue.

THE PROCESSING TAX continued through August to be the most disturbing fundamental factor in the cotton-textile industry, and promises to remain as such, until the Supreme Court renders a final decision with respect to its constitutionality. Any hope that the tax might be voluntarily terminated by the government was completely dispelled by the report of the Cabinet Committee, which recommended its continuation.

Market prices on some textile goods not only firmed up considerably, but in cases there were definite price advances, but on the whole the spectre of uncertainty in connection with the tax continued its shadow over any hope of widespread activity.

The Processing Tax Sales Clauses

In an effort to break the log-jam that had almost completely stopped the movement of goods, the Recovery Committee of the Association of Cotton Textile Merchants and several mill groups agreed upon and adopted a clause to be inserted in sales contracts, for the purpose of adjusting the controversy between the buyers and the sellers with respect to the processing tax on uninvoiced portions of contracts and on goods delivered immediately prior to the Supreme Court decision and on which the mills may have avoided payment of the tax. This sales note clause as recommended by the Association of Cotton Textile Merchants, and as adopted by several *cloth* mill groups, follows:

"If and when, for any reason, seller's liability for processing taxes levied under the Agricultural Adjustment Act, as heretofore and hereafter amended, is increased, decreased, or terminated, or such taxes shall be invalidated by final decision of the Supreme Court of the United States, prices on any uninvoiced portion of this contract are subject to adjustment at a rate computed on the basis of the conversion factors set up by the Treasury Decision 4433, approved May 10, 1934.

"In addition, the seller will credit on the buyer's account the amount, computed on the basis of such conversion factors, of any such tax, which, by reason of such invalidity, shall have been refunded to the seller or seller shall have been relieved from paying, with respect to any portion of this contract as to which the title has passed within *---------- days prior to such determination of invalidity. The title shall be deemed to have passed when goods are invoiced. No such credit shall be allowed hereunder in respect to any portion of this contract upon which a direct refund from the government on floor stock is recoverable by the buyer or any subsequent holder.

"In any settlement hereunder, seller shall be entitled to deduct on a prorata basis reasonable expenses of procuring any such refund or relief."

*120 days, converters; 90 days, cutters and wholesalers; 30 days, retailers.

The clause as adopted by the *yarn* mill group is as follows:

"If and when, for any reason, seller's liability for processing taxes levied under the AAA as heretofore and hereafter amended is increased, decreased, or terminated, or such taxes shall be invalidated by final decision of the United States Supreme Court, prices on any undelivered portion of this contract are subject to adjustment at a rate per pound computed on the basis of the conversion factors set up by Treasury Department Decision 4433, approved May 19, 1934.

"In addition, the seller will credit on the purchaser's account the amount computed on the basis of such conversion factors of any such tax which, by reason of such invalidity, shall have been refunded to the seller or the seller shall have been relieved from paying, with respect to any delivered portion of this contract, invoiced within 90 days prior to such determination of invalidity; provided, the buyer shall only be entitled to such credits with respect to such delivered portions, held as floor stocks, as to which direct refunds from the government are not recoverable by the holders of such stocks."

Of course, this clause was by no means entirely acceptable to all individuals and to all groups in the industry, but it represents the most practical and satisfactory compromise between two widely divergent points of view, and to some extent, it has been instrumental in opening up the cotton textile goods market which had been at a near standstill.

Congressional action on the amendments to the AAA was finally completed, and while it was the declared purpose of the amendments to clarify and strengthen the act, it is generally agreed that they have only served to further complicate a very confused situation.

Generally speaking, the amendments attempt to

ratify and legalize all previous actions of the Secretary of Agriculture with respect to the rates of the tax, its collection, etc., and also attempt to establish the tax by statute—this being done in an effort to overcome that part of the Hoosac case decision in which the courts ruled the tax to be unconstitutional on the grounds that it was an improper delegation of congressional authority.

However, in spite of this fact, the constitutionality of the tax still remains in doubt, because of the second part of the Hoosac case decision in which the courts ruled that Congress itself does not have the constitutional authority to attempt to control or regulate the production of agricultural commodities in the several states. Therefore, it would seem that Congress attempted to delegate to an executive department an authority which Congress itself does not possess under the constitution.

With respect to suits for recovery of taxes already paid, based on the unconstitutionality of the tax, the amendments neither bar such suits entirely, nor make any distinction between suits applicable to taxes that accrued before or after the enactment of the amendments.

Briefly, the amendments provide that, if and when the tax be declared unconstitutional, processors may file claims for recovery of taxes already paid if it can be proved that the tax in whole or in part was not passed on in the price of the goods to the purchasers of the goods, nor was it passed back to the producer of the raw product. In order to establish such proof, the claim or suit must be heard before the Commissioner of Internal Revenue, and the transcript of that hearing must be filed with and certified to the court, and that record will constitute the evidence in the proceedings. No trial de novo on the facts by the court is provided for, nor can any judicial proceedings be brought in the absence of the prior administrative hearing and record.

The same general procedure is provided with respect to claims for recovery of the tax paid on floor stocks held by wholesalers and retailers at the time the tax may be declared invalid. As in the case of claims for recovery of the processing tax, the burden of proof rests entirely upon the claimant, and such proof must be established to the satisfaction of the commissioner and the courts.

In the meantime great numbers of individual mills have secured injunctions to restrain the further collection of the tax, pending a final court decision. Many other mills have applied for and received extensions of time, postponing, temporarily, the date on which the next payments come due. There are still many other mills who have taken no action at all, but who are, apparently, waiting to see what efforts the government will make to force collection after August 29, the date on which the next payments, at this writing, are due.

There is some apprehension that, in view of the amendments just enacted by Congress, the Government may move to dissolve the injunctions that have already been granted, and that in such an event, further litigation, based on the new legislation, may be necessary.

It seems practically certain that, in the end, each mill will be required to take court action to avoid making any further tax payments, because extensions of time are limited by law to a maximum of 180 days after the returns are to be filed, so that the tax on cotton processed during April (the payment of which is due on August 29) cannot be extended beyond November 29, at the maximum, and it is generally conceded that the final decision of the Supreme Court in the Hoosac case cannot be rendered by that time, but will probably not be made until January of 1936.

The Social Security Legislation

As the atmosphere cleared following the adjournment of Congress, textile men were able to relax and "view the remains" by analyzing what had been done to them, as a major industry of this country, through some of the penalizing and vicious legislation passed in this session. While no legislation designed exclusively for textiles was passed, several vital impositions on industry will take their toll, if permanently effective, upon textiles along with the rest of the country's business. Truly, the time is coming when the piper must be paid.

The Social Security Act, now a law, provides for old age pensions, unemployment insurance, and old age retirement annuities, and a lot of other things. The old age pensions will be paid directly out of the Federal Treasury, without a special tax, and will supplement old age benefits paid under state pension plans. The old age retirement annuities will be financed by an excise tax levied against employer payrolls and employees earnings, after December 31, 1936. From 1937 to 1939 it will take 1 per cent of total annual payrolls and wages, increasing with every three-year period until 1949 and for that year and each year thereafter, it will take 3 per cent of total payrolls and wages.

The unemployment insurance plan is intended to supplement state plans, in that it permits as much as 90 per cent of the state tax for unemployment insurance to be credited against the federal excise tax for this purpose. The expense of the unemployment insurance plan is to be borne entirely by the employers through the tax on payrolls, the first taxable year being 1936. The rate of the tax on payrolls is as follows: 1 per cent for 1936; 2 per cent for 1937; and 3 per cent for each year thereafter.

In other words, an industry's total payroll taxes for retirement annuities and unemployment insurance will range from 1 per cent in 1936 to 6 per cent in 1950 and thereafter. It is estimated that by 1950, the total cost of the social security program will be costing employers, employees, and the taxpayers, a total of $4,296,000,000 per year.

The Wagner Bill

The Wagner bill, or National Labor Relations Act, also passed, practically turns labor relationships in American industry over to organized labor; it carries a vicious majority-rule clause requiring all employees to submit to the vote of a majority of their fellow-workers; it practically re-enacts old Section 7-A, strengthened; it prescribes 5 unfair labor practices by employers, specifies none by employees and labor organizations.

The Cabinet Committee Report

The report of the Cabinet Committee appointed months ago by Mr. Roosevelt to study and recommend plans for the cotton-textile industry, was delivered to him in August. Set up, presumably, to accomplish something, it produced nothing constructive. The kindest comment to be made about it is, in the words of a contemporary, "if the subject were not so serious, the report would be comical."

Studied Painting Procedure—A Key to Maintenance and Operating Economies

By Edwin M. Holt
Manager, Mill No. 3, Erwin Cotton Mills Co., Cooleemee, N. C.

PAINTING is one of a mill's major maintenance jobs. It can be handled systematically, economically and efficiently. Here Mr. Holt tells out of his own recent experience how, with competent counsel, the painting of his mill was carried out; how the job was planned, the colors and paints selected and applied. The photographs visualize the results by presenting some "Before and after" views.

Mr. Holt

The article is full of sound common-sense thought on the advantages of adequate painting, in appearance, better morale, and economy. It gives the methods used by this outstanding mill organization in approaching and executing their painting program, and is chock full of information that will be of value to other mill executives.

OBSERVING the results of a rather recent and extensive painting program carried out in our Cooleemee mill, it is the conviction of the Erwin Cotton Mills Company that one of the greatest assets to economical and efficient operation is a scientifically worked out painting schedule. By putting painting on a scientific basis we have found it possible to minimize painting costs and enjoy all the advantages of a well painted mill. It has meant, for example, that by careful selection of painting materials to insure maximum service under specific conditions we can cut down expense from repairs, that we can prevent losses from rust or paint of the wrong sort or improperly applied, which might fall onto rolls, looms, etc.

Advantages of Proper Painting

Properly employed paint also serves in many other ways in mills. We have found the use of a good mill white having a high reflection value to be one of the best ways of increasing the level of illumination, thus reducing complaints from eye strain and nervous fatigue among operatives. Applied to upper walls and ceilings, it gives an even distribution of natural or artificial light, which is essential to good seeing conditions. Less time is lost in making repairs and adjustments and operators work more efficiently. One particular advantage we have noticed is the effect upon the morale of the mill operatives. Bright, clean and attractive surroundings seem to stimulate them to both greater efforts and care. This does not exhaust the ways in which paint serves, but should suffice to point out that it is an operating as well as a maintenance economy.

What we mean by a scientific painting procedure can best be illustrated by the painting program we recently completed.

The first thing we did was to make a survey and detailed analysis of the condition of all wall and ceiling surfaces as well as pipe lines and other metal surfaces subject to corrosion. In the case of wall surfaces, both wood and brick, and deteriorated water and oil paints, had to be reckoned with. We were further confronted with certain problems which arise with any attempt to modernize older types of construction. Pipe lines had been changed from time to time with the result that holes were left through floors and sills. The electrical system had been changed and motors and machinery moved, leaving scars and dark spots on the walls and ceilings. There were the usual dust and dirt traps which it was desirable to eliminate, as well as undesirable clutterances. The brick walls had been painted numerous times with water paints or calcimine, and every mill man knows the time and material costs of having water paint falling into the machinery and manufactured goods. Our processes include cotton manufacturing from the opening room to the finished cloth. We finish colored goods, too, which gives us bleaching and dyeing processes. Consequently our paint problems probably comprise all those found in a cotton manufacturing plant.

What a Survey Showed, as to Our Needs

Our immediate problem was to completely refinish the plant in the most satisfactory manner possible and with due consideration of costs. A paint engineer from a leading paint manufacturer co-operated in making the analysis of conditions and in specifying the most permanently satisfactory way in which to handle the various problems. For one thing, it was agreed to plug all holes where pipes or wires had been removed from the beams, or had formerly come through the floor. All water paint was removed from the side walls by means of washing and wire brushing. By using common labor the cost was not prohibitive, and this precaution is essential to lasting results from any new mill paint to be applied. Where the bare brick surfaces showed any symptoms of an alkali condition this was neutralized by washing down with a solution of 3

Photographs, courtesy The Sherwin-Williams Company

A view in the Cooleemee spinning room before the recent painting. Note the impoverished condition of the old paint film on the ceiling, which was corrected with proper painting . . . . . .

pounds of commercial zinc sulphate crystals to the gallon of water. Insofar as possible, unsightly holes or cracks were filled and other eye-sores such as boards nailed up to serve as coat racks were eliminated.

Meeting Special Conditions

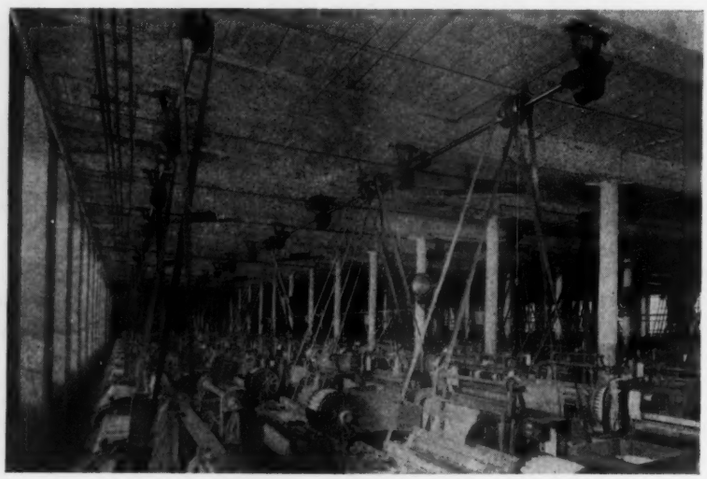
Wherever oil stains or grease spots appeared, especially on ceiling surfaces surrounding hangers and pulleys, these were thoroughly scrubbed with gasoline or benzine and then given a sealer coat of pure white shellac. Other special conditions found in the slasher rooms, dye rooms, and weave rooms, etc., were corrected according to exact stipulations by the paint engineer of the manufacturer supplying our finishes. In the case of any rough or porous surfaces a coat of special sealer and primer was applied to obtain the whitest, smoothest and most dirt- and moisture-resistant final finish possible. Where brick surfaces had been neutralized, the primer was applied about 48 hours after the wash down under normal drying conditions. According to surface and room conditions, anywhere from one to three brush coats of mill white were used on wall and ceiling surfaces.

The galvanized surfaces on exhaust ducts, ventilating units and other places had never been painted in some cases, or if once painted had peeled badly. When used in interiors it is desirable to paint these surfaces in most cases to obtain the added light reflection from mill white paint and to make them less conspicuous against the white background. No attempt should ever be made to paint new galvanized metal, however, without first etching it by means of a wash-down with a solution of 8 ounces of copper sulphate to the gallon of water, or by a solution consisting of 1 gallon of 56 per cent commercial acetic acid to 2 gallons of water. For special reasons the paint engineer may specify other suitable methods. Outdoor galvanized surfaces are best etched by permitting them to weather for at least six months. All new metal or galvanized metal used in interiors we first etched and then applied a coat of special zinc pigment primer. Only in this way have we found it possible to obtain good adhesion of paint on galvanized metal.

Working Out Color Schemes for Pipe and Dado

In making our plans for an attractive as well as serviceable paint job in the Cooleemee plant, there were two other important considerations. One was to work out a color scheme for pipe identification and the other, to select an effective color scheme for dados and accessory equipment that stands against lower walls.

In the case of all pipe lines, we were guided by the same points which decided our painting of exhausts

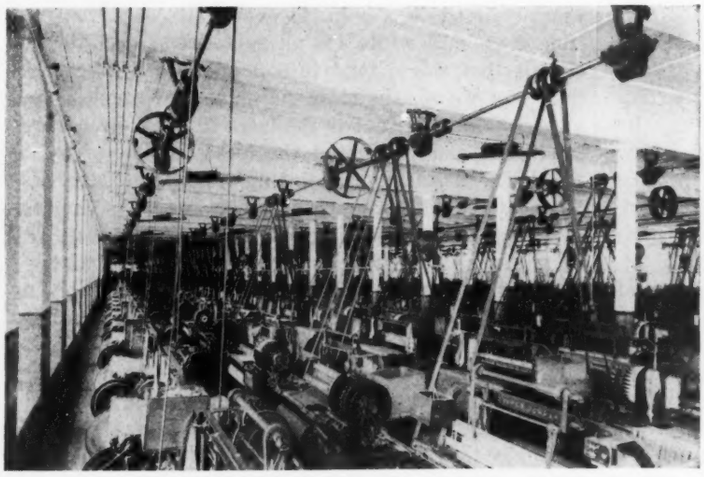


One of the Cooleemee weave rooms before painting . . .

A view in the spinning room, from the same point, after the painting was completed. The contrast between the two pictures shows the improvements wrought by proper painting . . . . . .

and ducts, etc. We wanted to have a maximum amount of light reflection from all surfaces, and also avoid the cluttering effect of having dark or sharply contrasting colors standing out against the white walls and ceilings. Consequently it was decided to paint all except the steam pipe lines with gloss white. The latter were given a coat of aluminum paint. Only fittings were given code colors to enable maintenance crews and operatives to readily identify the different lines. This method seems equally effective for the purpose of identification and results in an infinitely better appearing mill interior. The exact color scheme followed is shown in Chart A.

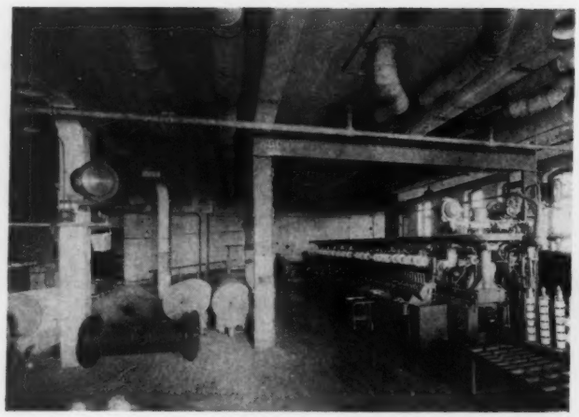
Dado colors formerly employed varied in the different departments. No standard had been chosen. The advantages of choosing one color are obvious. Changes in partitions, doors, windows and even walls, are not infrequently necessary. Where one color has been employed, it means that only one small package of paint need be opened to touch up the damaged places, instead of buckets of various colors of paint. In this way a material reduction in upkeep becomes possible. Appearance is perhaps an equally important reason for standardizing on one color. The particular color selected for a dado is primarily a matter of personal preference, but having recently installed machinery that is painted dark gray, it was decided to use a harmonizing shade of gray on all dados, and to carry this gray up 58 inches from the floor, or slightly below the working level of the shorter employees. In this way the high reflection value of the mill white paint applied to the upper walls was not sacrificed at the working level. A two-inch wide black belt was used as a dividing line between the gray dado and the white wall to emphasize the importance of maintaining darker colors and objects below that point. This black line also accentuates the whiteness of the white paint and adds a very trim effect. We have also observed that employees tend to keep soiled hands or objects below the black belt level.



The same weave room after painting . . .

Bobbin boxes, storage bins of various kinds and waste boxes placed at the end of spinning frames are finished in the same gray used on the dado. The result is, they tend to become part of the lower wall and do not appear to clutter. Pumps, motors, hangers and generators are finished in a standard motor gray.

The improvement in the entire effect throughout the mill resulting from the adoption of a standard color scheme, is remarkable. The operatives are so impressed with the orderly appearance of everything that they devote more attention to their appearance and surroundings. The increased level of illumination and improved seeing conditions resulting from the use



Note the great contrast in appearance, evident even in this greatly reduced size, between these two photographs of the automatic spooler department; left, before, and right, after painting . . . . . .

of the correct white paint on walls and ceilings not only is a production asset, it brightens the whole appearance of the mill with the result the operatives are also happier; they work better, and exercise more care in performing their work.

The Importance of a Good Mill White

One of the chief problems in mill painting is to get not only initial whiteness in a mill paint, but lasting whiteness. A poor grade of paint or paint wrongly selected for a given job is the usual cause of discoloration. Fume conditions require fume resisting paints. There are numerous other conditions found in the several rooms. The safe practice is to have a paint engineer analyze the atmospheric, chemical or fume conditions in each department, and then prepare specifications for the necessary surface preparation and most suitable type of paint. Applying mill white paint over a moist surface, or one not thoroughly cleaned of all foreign matter and loose paint is sure to result in an unsatisfactory paint job. We scheduled our painting program so that departments subject to high humidity could be finished during the warmer weather. There is less condensation for example, in a weave room at this time, and humidifiers can be shut off when the mill shuts down at the end of the week. By keeping the heat on, the walls soon dry out sufficiently to permit painting.

Preventing Formation of Mildew

Mildew formation in weave rooms is also a serious problem with many mills. This condition has its source in the sizing applied to the warp. This sizing is just a combination of everything that will become of fungus nature as soon as certain atmospheric conditions prevail. When raked off as the warp passes through the loom, it gets into the warm, humid atmosphere with the result that whenever a draft of cool air strikes the warm air, condensation takes place and mildew begins to propagate on nearby surfaces. Opening windows for ventilation is a principal cause. For this reason air-conditioning is being adopted as the best means of overcoming mildew formation. We have not found insecticide paints satisfactory, and they are dangerous to painters applying them as now commonly formulated. In our present painting program we made it a point to obtain the very best possible gloss mill white for all surfaces subject to conditions that would tend to soil or discolor them. In this way we obtain more permanent whiteness, and have a paint film that is the least affected by adverse conditions and will stand the most amount of washing down. It means re-painting will be necessary less frequently, and inasmuch as labor is always the biggest part of any painting job, our painting costs will be minimized by using the most serviceable paint.

Another way in which we saved considerably on our latest painting program was to make a careful estimate with the paint engineer and our own painting superintendent, as to the amount of paint necessary. By noting the amount required under given conditions in one department, and calculating the areas, we could estimate the amount required in other departments and thus avoid over-ordering.

PIPE LINE IDENTIFICATION CHART
The Erwin Cotton Mills Company
(Prepared by The Sherwin-Williams Co., Charlotte, N. C.)

Code	Fume Resisting Identifying Color	Body Finish	Surface
E-108	Heat Resisting Aluminum	Heat Resisting Aluminum	*Radiators Heat Manifolds Uncovered Steam Lines
E-109	Tartar Red (Fittings Only)	Save Lite Gloss White	Sprinkler System
E-110	(Fittings Only) Light Olive Green	Save Lite Gloss White	Humidifying System
E-111	(Fittings Only) Light Green	Save Lite Gloss White	Drinking Water
E-112	Light Brown (Fittings Only)	Save Lite Gloss White	Pneumatic Lines
E-113	Dark Brown (Fittings Only)	Save Lite Gloss White	Vacuum Stripper Lines
E-114	Light Blue	Save Lite Gloss White	110 Volt Electric Lines
E-115	Lemon Yellow (Fittings Only)	Save Lite Gloss White	220 Volt Electric Lines
E-116	Orange Yellow (Fittings Only)	Save Lite Gloss White	550 Volt Electric Lines

*Insulated Covered Steam Lines to have Coat of Slasher Size Followed by Aluminum

Chart A—Reproducing an identification chart for pipe line painting as supplied by the paint manufacturer. Such color charts are a part of the service supplied by modern paint engineers . . .

POWER ON THE PICK (Part 2)

By Ivar Moberg

THIS continues and concludes the discussion by Mr. Moberg on the subject of the power on the pick on a loom. The first installment, in August, explained the picking motion, and the present discussion covers in a clear way the setting and adjustment of the motion. Readers are urged to study first the August installment; then read this one on setting and adjustment . . . .

SINCE we now know that the curve of a pick cam or batwing is scientifically designed to start the shuttle slow from its repose and gradually increase the speed up to the maximum, we will better understand the setting and adjustment of the picking motion so as to give a smooth gentle pick.

The Need of Accurately Made Loom Parts

Before going on with this article I wish to say that a pick shaft and a pick ball made out of raw cast-iron without any machining done on them is indeed a poor piece of mechanics. The ends and the pick ball studs on the pick shaft and the pick ball should be machined and the pick ball should be made of steel and afterwards tempered. Many a time when we put one of these raw cast-iron pick shafts in the loom, we have to work for days to make it run right. The most frequent trouble with these pick shafts and pick balls is an uneven pick, that is, some picks are very hard while others are very weak, making it almost impossible to box the shuttle properly. One of the finest picking motions I have ever seen was on a German Schonherr loom. On this loom, every part of the picking motion was machined to perfection and if one of these looms banged off it was useless to try to start it again before the picking motion had been fixed. With poorly fitting parts in the picking motion, the loom sometimes bangs off for no apparent reason at all and if we start up the loom it might run a long time before the next bang off. However, I am glad to say that the days of "only a loom casting" are gone and the ultra-modern looms of today are really machines of fine mechanics. Some day we shall have looms in which the design and machine work will be of the same high class as that on sewing machines. The latest looms are closely approaching this stage.

Setting and Adjusting the Picking Motion

But let us go back to the picking motion. From what has already been written about the design and construction of a picking motion, the proper setting and adjustment will be more readily understood.

To set a cone picking motion mechanically, we proceed as follows: First adjust the picking shaft so that it will be in level and see that it turns freely in its boxes. There must be no binding or interference with a free movement of the pick shaft. Before we tighten up the pick shaft boxes we see that there is no end play whatsoever of the pick shaft. This would produce a terrific pounding at each pick and the end play would soon be greatly enlarged. Therefore, there must be no end play of the pick shaft.

With the pick cam set ¼ forward in the timing slot in the picking cam hub and with the stop-screw up against the pick cam shoulder, we draw the bolts, which hold it to the hub, up tightly. We now turn the loom so the crank shaft will occupy a position of 10 to 15 degrees beyond top center, if the loom is of the under throw type, and the same number of degrees beyond bottom center if the loom is of the over-throw type; few looms of the latter type are now in use in this country.

Turning the pick cam so its point will be directly under the center of the pick ball, we adjust it laterally on the cam shaft so the angle of the point will coincide with that of the pick ball. If the picking motion is correctly designed, this condition should be obtained with the pick cam hub against the cam shaft box.

Now we turn the pick cam on the cam shaft so it will just start to displace the picking cone and tighten up the set-screws in the hub. If the hub is a split hub, we must first tighten up the bolts which clamp it on the cam shaft, seeing that the set-screws are well out. Only after the bolts are tightened up properly, can we tighten up the set-screws; under no condition should we tighten up the set-screws before the bolts are tightened.

Turning the loom over one complete pick we repeat this setting on the other side of the loom.

Next, we adjust the picker arm so it will be in the center of the adjustment slot, and tighten up the bolt that holds it to the pick shaft. We now locate the lug strap on the picker stick so it will be approximately 1-inch above horizontal and adjust its length so that, with the pick cam point directly underneath the picking cone, there will be from ¾ to 1-inch clearance between the picker stick and the bunter in the lay. We also see that there is at least ½-inch play between the picker stick and the lug strap bunter. The length of the lug strap must be sufficient to allow the lay to go over the front center without pulling the picker stick inward.

To set the batwing picking motion, we first adjust the picking shaft so it will be in level and turn freely in its boxes and without any end play. Most of the batwing picking motions have the hub of the pick ball arm keyed to the cam shaft, so we can only move this laterally. With the picking ball stud in the center of the adjustment slot in the picking ball arm, we move the picking ball arm laterally so that the batwing will rest against the center of the pick ball. With the crank shaft 10 to 15 degrees above the top center, and the picking ball arm in a vertical

position, we move the batwing on the pick shaft so the pick ball will be from ⅓ to ½ of the way up on the curve. This is only a preliminary setting and may have to be altered to suit the force needed on the pick.

Now adjust the tilting of the pick shaft so the pick ball will come into contact with the batwing at the bottom of the curve when the loom is turned over. The tilting of the pick shaft is adjusted by lengthening or shortening the lug strap, having previously located the lug strap on the picker stick approximately 1-inch above horizontal. The latest C. & K. looms have a stop-screw in the picking arm, the length of which can be adjusted to tilt the picking shaft the exact amount regardless of the length of the lug strap. Now see to it that there is about ½-inch clearance between the picker stick and the lug strap bunter. Also see that there is proper clearance between the picker stick and the bunter in the lay at the end of the stroke.

We have now set the picking motions mechanically correct, and the final adjustments are of a more technical nature.

Timing the Picking Motion

We now come to the timing of the picking motion which is of equal importance to that of the setting. We must bear in mind that the most ideal time for picking the shuttle would be with the lay at extreme back center. At this point the shed is fully open, the shed is down on the race board and the position of the reed gives the shuttle plenty of room and freedom from most of the retarding forces. However, such a late pick would not give enough time for the passing of the shuttle and would cause the loom to bang off. Therefore, we must time the pick earlier, and the usual practice is to start the pick with the crank shaft on top center or a little later.

We have a choice in starting the pick at top center to 25 crank shaft degrees later. The pick should not be timed before top center, and later than 25 degrees beyond. As in the first case the retarding forces would be too great on the shuttle, and in the second case the time allowed for passing would not be sufficient to lift the protector daggers over the frogs. In both cases we would have to add force to the pick.

The shuttle should be set as loosely as possible without causing the shuttle to rebound. If we have the shuttle box too tight, we are building up pressure behind the shuttle which the picking motion has to overcome. This causes a great torsion on the picking motion and on the loom in general. While the resistance to the acceleration of the shuttle in this case is much greater than if the shuttle box was properly set, the velocity of the shuttle will be increased but the flight will be very unsteady. The reason for this is that when the pressure is built up behind the shuttle, the torsion of the picking motion and the resilience of the picker stick combine with the force on the pick to give the shuttle a vigorous snap as soon as the resistance is overcome. It is the same action as that of a high powered rifle where a terrific pressure through resistance is built up behind the bullet and the sudden cessation of this resistance gives the high velocity to the bullet. Similarly, it is the sudden ceasing of the resistance that gives the shuttle higher velocity than if the shuttle boxes had been more loosely adjusted, provided, however, that the belt or friction clutch is not slipping under the strain.

To illustrate this better, let us suppose that the acceleration of the shuttle is figured to take place during 40 crank shaft degrees, but that the resistance from the shuttle forces a torsion of the picking motion which will delay the start of the acceleration, say, 10 degrees; the latter must be completed in 30 crank shaft degrees with correspondingly higher velocity. This is a condition against which we should be on our guard. To avoid this, we should set the shuttle box as loosely as possible and let the picker stick check do most of the retardation of the shuttle.

It might well be asked whether this does not wear out the check strap much faster. Well, it does, but it is cheaper to pay for check straps than for a multitude of other parts which would give out if we let the picking motion do more work in added foot-pounds. The loom builders have a device for releasing the shuttle from most of the resistance just before the pick. It is strange that more of these devices are not used for they certainly save a lot of foot-pounds for the picking motion and the loom in general.

The parallel motion should be so adjusted that the picker moves parallel to the box plate, without depressing or lifting the shuttle on the box plate during the pick. This means that if we move the picker stick by hand for the full distance of the stroke, the picker should have a barely perceptible rise at the end of the stroke. This is necessary in order to allow for the slight bend of the picker stick during the pick, which will shorten it somewhat.

The Importance of Proper Lining

In order to have a smooth and gentle pick of the loom, it is imperative that the loom be lined up properly. Any neglect in this respect is certain to give the shuttle an unsteady flight, and improper boxing, which means that we will have to add force on the pick to get the shuttle across. The box back and the reed should be in perfect line and the race board and box plates in perfect level and of uniform height. In lining up a loom it is preferable to use a straight-edge long enough to span the entire width of the loom. A short straight-edge will fool us many times, no matter how careful we are. With a 90-degree square, we should check the angle of the reed and box backs in relation to the race board and box plates. This angle must never be over 90 degrees, but it can be 1 or 2 degrees less. If it is over 90 degrees, the shuttle will have a tendency to rise in the box which results in lost power and unsteady flight of the shuttle.

Having made the necessary preliminary adjustments we run the loom by power, one pick at a time. If we are experienced fixers we can tell by the response of the loom whether the pick is somewhere near right for the specific condition. If it is, we start the loom and watch its performance. We first see to it that the shuttle boxes properly and then

placing our hand on the right-hand side of the reed cap for the left-hand pick, and on the left-hand side for the right-hand pick, we note whether the shuttle runs without any jar or vibration during the acceleration of the shuttle. We can also watch the main driving gears to note whether they seem to come to a complete stop for a fraction of a second during the acceleration of the shuttle, if so, the pick is too harsh or improperly adjusted.

Even if the loom apparently runs well with the preliminary setting of the picking motion, we nevertheless try to reduce the force on the pick. To do this, we either raise the lug strap on the picker stick or shorten the picking arm and readjust the length of the lug strap. We continue to reduce the force on the pick until the loom bangs off, due to insufficient force on the pick. Then we drop the lug strap on the picker stick one hole in the support, or lengthen the picking arm correspondingly, and again check the length of the lug strap. We may also have to re-time the picking motion so it will pick a little earlier or later as the case may be. Picking the shuttle from the plain end of the lay, we must guard against so weak a pick that the shuttle would not pass the tip of the shuttle feeler in time as it is coming up for the transferring of bobbins. This would push the shuttle feeler back, depressing the latch finger, and the transferring would not take place.

Setting the Harness Motion

Closely associated with the correct setting of the picking motion is the harness motion. If this is not properly set and properly timed, a smooth, gentle pick cannot be obtained, as we would have to add force on the pick to prevent the loom from banging off.

If the loom should develop an occasional bang off, we must not take it for granted that there is not enough force on the pick. Before we apply more force on the pick, we should check the whole picking motion to see that there are no parts loose or that some parts have not slipped, that the cam shaft boxes are not loose, that there is not too much play between the driving gears at the point of picking, that the shed is properly opened and down on the race board when the shuttle is picked, that the harness motion is not out of time, and that there is enough power on the loom to carry it over the acceleration period without slowing the loom down. First, it is only after we are assured that everything else is entirely O. K., that we should add force on the pick.

We should bear in mind that while the velocity of the shuttle during the acceleration period is practically positive, the velocity after it leaves the picker is dependent upon the retarding forces. This means that we should reduce the retarding forces as much as possible. To do this, we must have a clear, open shed, timed so it will give the shuttle the right-of-way during its travel across the loom. Most fabrics can be woven with the upper shed slack, and this will greatly reduce the retarding effect of the warp threads on the shuttle. If we have the upper shed tight, the shuttle will be more pressed against the rare board and the co-efficient of friction will be greatly increased. Consequently, we would have to add force on the pick to overcome the increased retarding forces. The shed should be large enough to clear the shuttle and although a large shed will place more strain on the warp threads, it is, in most fabrics, less harmful than if the shed were so small that the shuttle would have to "plow" its way through the shed. The reed will also have a retarding action on the shuttle. A sharp, poorly made reed will have more of a retarding effect than a smooth, well made one.

If the loom has been changed over from a heavy fabric to a light fabric, we should not neglect reducing the force on the pick if possible. If the picking motion is correctly set and adjusted, we should not be able to run a heavier and wider fabric in the loom without adding force to the pick. Nor should we run a lighter and narrower fabric in the same loom without taking some force off of the pick.

Analysis of Textile Graduates of N. C. State College

Professor T. R. Hart of N. C. State College has recently completed a survey which indicates that the textile industry is a fertile field for technically trained young men. During the depression period of the last five years many young men throughout America, upon graduation from college have found it difficult to secure employment, but the textile industry has continued not only to absorb, but to offer real opportunities to young men who were thoroughly trained for service in this field of endeavor.

Professor Hart found that of the 146 young men who graduated from the textile school of North Carolina State College during this five year period, 1931-1935 inclusive, 132, or more than 90 per cent, are gainfully employed in some phase of the textile industry and are making progress. After graduation from a textile school it is necessary for a young man to obtain a certain amount of practical experience before he begins to climb the ladder of success, yet this survey shows that some of these 132 young men are now filling such responsible positions as vice president, sales manager, superintendent, assistant superintendent, designer, assistant designer, textile chemist, and departmental foremen in cotton mills, hosiery mills, rayon plants and finishing plants. Others are performing useful service as salesmen of rayon and other textile products, as technicians in testing and dye laboratories which the mills and manufacturers have established to place their plants upon a more scientific basis, or as teachers in textile schools.

The homes of the 132 young men, graduates of the State Textile School during the 5 year period 1931-1935, who are now employed in the textile industry, were distributed as follows: North Carolina 107, Georgia 5, South Carolina 4, Virginia 3, Alabama 2, Texas 2, New York 2, Rhode Island 1, Massachusetts 1, Connecticut 1, Maryland 1, Illinois 1, India 1, Bulgaria 1.

The present location of these young men is as follows: North Carolina, 101; Tennessee, 6; Georgia, 6; South Carolina, 5; Virginia, 4; Alabama, 2; New York, 1; New Jersey, 2; Connecticut, 1; Massachusetts, 1; Ohio, 1; South America, 1; and India, 1.

Another interesting fact brought out by this study was that the class of 1935 contained six men who were brothers of men who had previously graduated from the Textile School.

THE DRAPER LOOM CLINIC

Done into a Story by the Editor

THE Loom Clinic is a new type of service that has been originated for weaving mills by the Draper Corporation. The service is appropriately named, as it is in fact similar in its origin, its procedure, and its results, to the generally adopted program of periodical examinations of the human body, to preserve health and physical fitness, as taught by modern medical science. Like its counterpart, the medical clinic, the loom clinic serves the corrective and preventive ends.

We recently had the privilege of observing one of the Draper loom clinics in operation at a prominent southern mill. The purpose of this report is to tell what we saw, and in the telling to describe the procedure of the clinic. The accompanying photographs were made at the time, at the mill in question, especially for illustrating this article. They are unretouched and show as clearly as is possible in reduced size, the actual conditions as revealed by the clinic.

Mill machinery, like the human body, may conceal hidden warnings of trouble that may be warded off by proper treatment. Looms, particularly, if the mill does not have an adequate program of maintenance, present problems arising, especially, from improper fixing and improper lubrication. This is particularly true in a mill on double-shift operation, where the equipment is operated by two shifts of weavers and fixers, and sometimes under two overseers. Certainly in no department more than in weaving, does a worn part show up more readily in the form of lowered efficiency or quality, or both, and in increased maintenance cost.

The loom clinic consists of pulling a loom down, and checking over carefully the condition of all its parts. One of the photographs shows how the loom appears ready for this diagnosis. Without cost to the mill, Draper sends to the mill a service man, who takes any loom designated by the mill, pulls it down, cleans off the parts, and spreads them on the floor, as shown in the photograph. Then a Draper representative calls, and, in company with the mill superintendent or manager, and his men, carefully examines the parts, and thus secures a picture of the true condition of the loom, available in no other way. From this examination it can be readily determined which parts should be replaced, and it is a reasonable assumption that the other looms in the plant, under similar conditions of service, age, maintenance, etc., would represent like conditions.

Even in mills where a better-than-the-average system of maintenance is carried out, it has been found that the complete diagnosis of a loom completely pulled down will usually reveal many hidden and unsuspected causes of lowered production, efficiency and quality. The mill where we witnessed the clinic is an example—a well-run plant that does not stint on its maintenance and that operates efficiently with good fixers and oilers whose work is carefully laid out and supervised. The superintendent who was our host, and whose personal bashfulness precludes the use of his name or the name of his plant, enthusiastically told us that the clinic was of incalculable value to him and his mill, because of the real information it provided for him and his men as to the true condition of the "insides", if you please, of his looms.

This photograph was made of the loom selected for the Clinic, showing how it was completely pulled down and all of the parts laid out on the floor for careful inspection. The other illustrations show some of the worn parts that were found.

We were told of an overseer of weaving who, prior to a clinic in his department, conscientiously insisted that it would not show up anything about his looms that needed attention. He did have good fixers, and oilers, and he saw that they did their work. But as soon as the loom was taken apart, he realized that for some reason beyond his control, his semi-weekly oiling of his take-up roll bearings which had been observed religiously enough, had failed to get the oil to the proper place, and some uneven cloth, for which he had been blaming the let-off, was obviously

coming from excessively worn take-up roll gudgeons. This is not an extreme illustration, and the experience was certainly borne out in other directions, in the mill where we witnessed the clinic.

Instance after instance could be given of similar findings, but, returning to the mill in question, let us offer as exhibits the accompanying photographs, which, as stated, were made at the mill, showing in two cases, worn parts taken from the loom that was "operated on", along with new parts taken out of the mill supply room, for comparison. The other photograph clearly shows the wear in the take-up roll gudgeon and bearing.

With each photograph are listed some of the troubles resulting from the wear in question; the practical mill man will readily recognize these, and could undoubtedly add to the list in each case.

We leave to these photographs, showing three of the most commonly found sources of wear which are not readily ascertained by the usual periodic inspection, the telling of what was found. Similar illustrations might be given of wear on let-off parts, take-up gears, head gears, crank arms, cams, treadle rolls, etc., etc.

The corrective feature of the clinic comes in showing the work to be done (1) by the immediate replacement of worn parts; (2) by better and more effective fixing; and (3) by better and more effective lubrication.

The preventive feature is best utilized by conducting the clinic just before overhauling the looms—which happened to be the situation at the mill we were visiting. Instead of doing the overhauling blindly, a mill may get, through a clinic, an intelligent, comprehensive picture of what must be done for a thorough, effective job. In addition, oftentimes the clinic will reveal a condition which, if allowed to continue, would later result in serious trouble and excessive expense; whereas the immediate replacement of a part, or a change in the oiling plan, would prevent the potential break-down from occurring.

Returning home from the clinic, we recalled a previous journey to the clinic of a leading southern diagnostician, who found some rather serious hidden complications in a body which its possessor had always thought was relatively sound, and who suggested means of correction and maintenance which were simple but effective, and undoubtedly prevented more serious trouble later. And we couldn't forget that story of the overseer and his take-up roll bearings—and the moral it points to the mill man who hasn't seen one of his looms taken apart and laid out for careful diagnosis and inspection.

At left, a new part (L-37932) taken from mill supply room; at right, a similar part as taken from loom examined in Clinic. Note the worn pick cam toe shown at right . . . . . .

TROUBLES RESULTING FROM WORN PICK CAM TOES:

1, Loss of power on the pick motion. 2, May cause looms to bang off, due to shuttle not getting into the box properly. 3, Will cause the shuttle to enter the right hand shuttle box a little late, making it difficult to transfer the bobbin properly, and result in poor operation of the shuttle feeler thread cutter.

At left, two new rocker shaft bearings taken from mill supply room; at right, two worn rocker shaft bearings as found on the loom examined in Clinic, with the worn bushings shown below . . . . .

TROUBLES RESULTING FROM WORN ROCKER SHAFT BEARINGS:

1, Improper operation of the filling fork, resulting in thin places. 2, Improper transfer of bobbins, resulting in smash-ups. 3, May cause considerable difficulty in picking the shuttle across the loom properly. 4, Allows the lay to drop down and thereby destroys the proper relation of the protector rod to the frog piece, which means that the loom may give trouble banging off.

Showing a worn take-up gudgeon and bearing, as found on the loom pulled down in the Clinic . .

TROUBLES RESULTING FROM WORN TAKE-UP GUDGEONS AND BEARINGS:

1, Thick and thin places. 2, Uneven cloth. 3, Slack selvages. 4, Difficulty in properly meshing take-up gears.

MERCERIZATION—Its Place in Relation to Other Processes (Part 2)

By J. Andrew Clark

Chief Chemist, Dutchess Bleachery, Inc.

THIS continues and concludes Mr. Clark's article on this subject, which began in the August issue, page 43. In it, he gives a brief history of swelling, luster and untwisting, and comments on the proper location of mercerizing in the range of processes, in relation to bleaching, dyeing, etc. . . .

HYDROLYSIS with water constitutes the second step in mercerizing. Since this operation is generally run for the production of luster, ranges are designed for the hydrolysis and partial removal of the caustic to occur with the cloth under tension. The more common installation consists of a tenter frame so fitted that water sprays can be directed on the cloth, during its travel along the frame. The first spray is generally so located that the cloth has a saturation in caustic of one half to three-quarters of a minute before reaching it, while in addition, several other sprays help to complete this reaction as well as remove the caustic. Thus, when leaving the frame, the greater part of this will have been removed from the fabric. Subsequent treatment in wash boxes, recuperators, etc., completes the process. In this connection, it is recognized that variations in the properties of the fabric can be produced by slight changes in the treatment with water.

The effect of the complex physical-chemical changes which occur when the sodium and hydroxyl ions are removed is thought to be modified by changes in the method of washing, since the removal of these ions causes reduction of the osmotic pressure. The reduction of osmotic pressure, in turn, permits the swollen fiber to contract and the nature and extent of this contraction directly influences the appearance of the finished fabric.

Thus, the extent and kind of washing to which the fabric is subjected on the frame, theoretically is of vital importance, and has been found equally so in practice. Some finishing plants, with this in mind, have conducted elaborate trials to test the performance of various types of water sprays and methods of washing. One of the simplest forms used for spraying is a horizontal perforated pipe. Unfortunately, the holes are often spaced too far apart, which in conjunction with the travel of the cloth on the frame, often causes irregular mercerizing, occurring in warpwise streaks. Followed by dyeing, this condition may be very pronounced. One so-called and self-admitted practical mill executive of the writer's acquaintance recently complained of his inability to mercerize for luster properly. He had formerly traced warp streaks to a poorly designed spray system of the previously mentioned type, and eliminated that trouble, as he naively explained, by their removal. Inspection of his machine showed this to be actually operating without sprays of any kind on the frame; neither did it yield any luster.

Opinions differ as to the best type of spray or washing system. Horizontal troughs or cascades which discharge a thin uniform sheet of water across the width are used on some machines, while others employ sprays of various types. These sprays are often operated with considerable pressure as to force the water through the cloth. The use of sprays permits bottom washing, and while the advantages obtained by this are disputed, it is employed by some of the largest finishers, who claim this prevents the condition known as "face mercerizing."

To summarize then, the washing on the frame should first of all be uniform, irrespective of the type spray or system employed. In addition, the first spray should be so located that the cloth has had a ½ or ¾ minute minimum saturation before washing starts and sufficient washing should take place on the frame to reduce the residual caustic below the concentration that would permit after-shrinking occurring on the release of frame tension. In addition, in those installations using acid neutralization in conjunction with the final washing, good caustic removal on the frame results in economy of acid.

This hydrolysis and removal of caustic essentially completes the reaction to yield a cellulose of increased reactivity, which is considered by several investigators to occur through intermolecular changes without degradation of the molecule. That the latter does not occur is demonstrated by comparisons of values obtained before and after mercerization, from tests used to measure the degree of degradation of cellulose. Such tests are the Copper Number, Fluidity and Methylene Blue Absorption, all of which show values practically unchanged after mercerization. The change in reactivity, however, is thought of as an increase in the value of properties already possessed by cellulose rather than as an acquisition of new ones. Thus, as one example, the regain of mercerized cotton is greater than that for the original cotton, increasing roughly in direct proportion to the strength of the caustic employed. This increased reactivity, on the other hand, is considered to make the mercerized fiber more susceptible to damage from chemical treatment with consequent loss of luster, when this operation precedes

boiling and bleaching. Many finishers, therefore, advocate mercerization after bleaching.

Recovery of caustic is usually of economic importance in the operation of most installations. To economize on the volume of water as well as to yield a spent liquor of maximum strength, washing is often conducted on the counter-current principle. In its simplest form, this consists of using the dilute caustic wash water for the first one or two sprays, the others using water, often heated to further assist washing.

The Final Washing

Final washing is usually conducted in range with the saturator and frame. The details of this vary in different installations with the conditions surrounding the subsequent handling of the cloth. Where kier boiling follows this operation, simple washing may be sufficient. With bleached goods, the standard, but by no means universal procedure consists of a water wash, neutralization with acid, wash, ammonia or soda ash neutralization of the acid, followed by a final wash. Various types of washing equipment are in use for this purpose. Compartment boxes of various types with squeeze rolls between sections are commonly used. Other types, often called "recuperators", employ steam compartments in which the condensed steam acts as the washing medium. Tests of these latter types show a residual caustic content of from .3 to .85 per cent on the weight of the goods, according to their construction.

Colored yarn oxfords, figured broads, and other such colored fabrics, when intended for peroxide bleaching in a kier, would ordinarily carry an excess of caustic alkalinity for that process, if taken from a range with wash boxes only. Prevention of bleeding and mark-off due to this would then require extra washing or mercerizing following the bleach.

Irrespective of the systems used for washing, care should be exercised that the goods are not permitted to partially dry out. As far back as 1908, Knecht demonstrated that mercerized cotton absorbed different quantities of dyestuffs, dependent on the manner of drying. While 3.24 per cent of a certain color was absorbed by mercerized cotton that had not previously been dried, 3.03 per cent was absorbed by air-dried material as compared to 2.51 per cent for material dried at 230 degrees F. When mercerization precedes dyeing, care should thus be taken that the selvages or other areas are not permitted to dry out, or irregular results may be obtained, which can only be corrected by remercerization.

The Influence of Local Conditions

The proper position of mercerization in relation to the finishing of any particular fabric is most often determined by the individual plant in the light of their experience with that particular fabric, their mechanical lay-out, process routing, as well as the personal preferences of those in authority. More vigilant oversight of costs with elimination of charges for mercerizing in some lines has caused routings to be scrutinized generally for opportunities of cost reduction. One of the first changes was the elimination of double treatment. Mercerization before and after kier boiling was formerly the accepted procedure for oxfords and broadcloths in many plants that now have reduced this to a single treatment.

Whether to mercerize in the grey after steeping or desizing or after the boil, often merely resolves itself into a consideration of cost, influenced to a great extent by the location of the mercerizing range in relation to the kiers and steeping bins or chutes.

It would seem that mercerizing following the kier boil would offer the better opportunity to obtain more uniform and thorough saturation with caustic, since then the warp size and any grease and dirt from the weaving mill will have been removed. In addition, the mercerized cotton is much more reactive than the untreated material and experience has shown that to maintain the maximum high luster, minimum chemical treatment only should be employed following this. Thus, for example, one large finisher of shirtings, who maintains a well-equipped testing laboratory for plant control, mercerizes cloth after bleaching with excellent results. On the other hand, a much larger plant mercerizes in the grey using caustic often as thick as molasses with impurities, and by proper control is able to secure commercially satisfactory results.

Heavy, faced fabrics, such as gabardines, twills, etc., often cause trouble from uneven dyeing after mercerizing. This class of goods is quite difficult to saturate evenly with caustic, either in grey mercerizing or in this treatment following a boil. Since the construction of these fabrics usually demands treatment in the open width to prevent cracks and crow's feet, the scour is rarely as efficient as a kier boil in producing absorbency. In addition, the danger also exists of causing box marks and cracks in taking these goods from the mercerizers. One successful treatment has been to mercerize after dyeing, especially with vats and sulphurs.

As mentioned earlier, caustic treatment without tension to increase the affinity of cotton for dyestuffs, was the earliest form of commercial mercerizing, and as such, made no great headway towards general adoption. The advent of the expensive vat colors caused this procedure to be revived, especially as a pre-treatment for heavy shades. Twenty-five per cent or more less color will often suffice to dye a shade on cotton so treated. In this treatment, moreover, variations in caustic concentration also produces differences in depth of color. We are indebted to Heubner and Pope for their investigation of the factors determining this, a rough, partial summary being that up to 18 degrees Tw., the increase in color absorption is roughly in direct proportion to the caustic concentration, and from 18 degrees to 30 degrees Tw., the rate of color absorption increases progressively faster than the increase in caustic concentration. Above 30 degrees Tw., the rate of color absorption decreases. In practice, then, we find half-mercerizing conducted at 25-30 degrees Tw. as a pretreatment for dyeing heavy shades with vat colors. Although it is not entirely necessary to remove the caustic while the fabric is under tension when mercerizing for this purpose, width may be obtained easier in the final finishing op-

(Continued on page 124.)

Good Motor Maintenance Methods

By Francis A. Westbrook, M. E.

THE need of maintaining motors in some systematic manner so that interruptions in the production of the machines which operate, of course, does not need stressing, but the way in which it is done and how good practical systems have been developed is always interesting and helpful to those who have this problem. A very interesting example of this exists at the plant of the Pacific Mills at Dover, N. H., where the chief engineer, Mr. Ansel Holman, has, ever since 1920, been looking after his motors with great care and success. He started a card file at that time and has kept it up ever since, and, as time went on, he profited by experience and has made his system of motor maintenance more and more effective. As group drive is used very largely here the failure of a motor in most cases shuts down an important block of production machinery so that in order not to have the schedules upset any more than is possibly avoidable from this cause very definite precautions must be taken.

There are in the plant 225 motors in all, aside from those of fractional horse-power for the humidifier heads. These latter are taken care of by the departments in which they are located and are outside of the drives under consideration here. Of the 225 motors, 160 are on group drives and vary from 10 to 200-hp, and serve practically all of the productive machinery. There are also 60 individual drive motors of 5-hp each for auxiliary and productive machinery.

The card file consists of a card for each motor giving its complete history. As a matter of fact as the record has been kept now for nearly 15 years each motor has more than one card, in some cases as many as three. The file for Motor No. 17, picked at random from the file, is reproduced here. It will be noted that in addition to the usual data at the head of the card giving its location, type, serial number rating, etc., there is a record at every inspection, every fuse replaced, every cleaning of the bearings, every switch inspection and so on. In other words everything pertaining to the operation and maintenace of that motor is assembled here where it is easily studied and referred to.

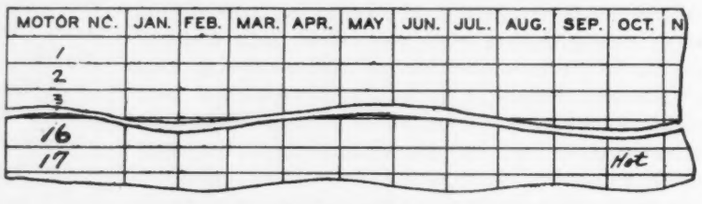
The manner in which inspections are made at the present time has not been followed from the beginning but is the result of what experience has shown to be desirable. Some of the things done now have only been in force for two years and this must be borne in mind when comparing the following description with the entries on the five-day-week schedules. In fact this

A crew of four men inspects every motor once a week, at the present time on Saturdays when the plant is shut down on the five-day-week schedules. In fact this Saturday closing, Mr. Holman feels, is a very distinct advantage from the maintenance standpoint as it gives an excellent opportunity to keep all of the machinery in good condition at all times. Three of these men clean and blow out the motors. The fourth man follows them and does the inspecting. This is just a looking over for signs of trouble such as heated bearings, operation of the control apparatus, burned coils, and so forth. If the inspector finds something which he thinks is wrong and which may cause trouble before the next weekly inspection he notifies the chief engineer who issues orders for the necessary repairs. Once in six months the motors have their bearings flushed out with kerosene and new oil is put in.

Once every six months all switches are inspected and repaired if necessary. The oil is also changed at these times.

In addition to this there is a monthly inspection of the fuses at each motor. The inspector examines and feels of each fuse to see if it is heating and looks at the connections and terminals for discolorations which might be caused by heating. The results of the monthly fuse inspections are entered on a separate chart from which the fuse conditions throughout the plant can be seen at a glance, and shows very distinctly any points where steps may be necessary to correct undue fuse failures. A portion of this chart is reproduced to show how it is made up. For instance it will be seen that on the fuse inspection chart that the fuses for Motor No. 17 were found hot on the Oct. 1, 1933 inspection. On the card record for Motor No. 17 there is an entry showing that these fuses were changed on Oct. 3rd.

When the system of card records was first started it was difficult to get the maintenance men to report what they found and what they did so that it could be entered on the cards. It took some time to educate them to do this and to convince them of the advantage of doing so. Now, however, they frequently come into the chief engineer's office to consult this file when they are working on a motor to see how it has been behaving in the past and whether the same trouble is repeatedly occurring, or if there is an undue amount of trouble. If there is too much the instruments are brought out and tests made to determine what the difficulty may be. For instance, it happens every once in a while that some of the production machinery is speeded up for some reason, and this, of course throws a heavier load on the motors and fuses, and may also be cause for the read-



MOTOR NO.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	N
1											
2											
3											
16											
17										Hot	

The monthly fuse inspection record

justment of switches.

As a result of the system of maintenance just outlined only three motors have been burned out in five years and there have been very few interruptions of service due to other electrical causes. About four years ago 16 of the newest type of induction motors were installed and not even one fuse has been lost on them in all that time.

As already stated, Mr. Holman developed this system as he went along. The regular fuse inspection was started five years ago, and showed very good results. The present plan of motor inspection was started only two years ago. There will be other changes and modifications as time goes on, perhaps due to the aging of the motors, and of course due to changes in manufacturing methods and procedures. No good system should be rigid, Mr. Holman believes, and he has kept his flexible.

MOTOR No. 17

Location	#3 Upper Spinning	Speed-No Load	900
Serial No.	232341	" Full "	870
Type	1-8-50A-900	Pulley	13X13X3
Form	L	Belt	10 3/4
Rated Hp.	50	Fuses	90
Test Hp.		Circuit	3

Duty 10 Spinning Frames, 2400 Spindles. Sw. 263947 FK14

1-17-20	Inspect switch & change oil
6 25-21	Adjust Brushes
9-10-21	Inspect Switch & change oil
1-23-22	Change oil bearings of motor
7-31-22	1 fuse
9-14-23	1 fuse
11-27-23	Change oil in Bearings
11-5-24	2 fuses
12-29-24	Motor stopped twice
1-2-25	Motor stopped once
1-3-25	Clean switch
2-14-25	Inspect switch
4-18-25	Change oil in bearings
7-25-25	Change Pulley - also broken glass in oil sight gauge
9-28-25	Set Belt
1-20-26	Inspect switch
4-10-26	Move switch to clear travelling cleaner
12-17-26	off - cause - # 031 fuse blown

Above and below, record card showing inspections of Motor No. 17 . . .

1-14-27	1 fuse - inspection
3-19-27	Change oil in bearings
11-13-27	change Resistance
3-16-28	1 fuse - cause - Main fuse # 031 blown
3-17-28	Inspect switch
6-22-28	1 fuse - cause - # 031 blown
12-29-28	Inspect switch
4-2-29	clean bearings - change oil
3-27-29	Weight on low voltage trip fell off
4-1-29	1 fuse
3-8-30	Inspect switch
2-7-31	Inspect switch
8-20-31	1 fuse - # 031 blown
8-26-31	1 fuse - # 031 blown
9-5-31	Inspect Switch - 1 mv contact changed
10-15-31	1 fuse - # 031 blown
10-21-31	2 fuses
10-31-31	change oil in Bearings
3-24-32	Fuse fallen out
7-20-32	Change Resistance & Brushes
8-9-32	1 fuse
12-12-32	1 fuse
12-17-32	Inspect Switch
6-3-33	change oil in Bearings
10-3-33	change fuses - Inspection - found hot on fuse inspection Oct. 1st
11-21-33	1 fuse
2-16-34	1 fuse
5-9-34	2 fuses
7-20-34	Inspect switch

THE SLASHER ROOM

Part 3

By Joseph W. St. Rock

THIS is the third and concluding installment of the discussion of The Slasher Room and its equipment and operation by Mr. St. Rock. The previous sections appeared in the July and August issues. The complete series of three articles is well worth filing together.

Later, we hope to present other, self-contained articles on different phases of slashing by the same author . . . . . .

IN ADDITION to the diagrams mentioned in previous installments, it is important that the man in charge of slashers have also at hand the dimensions of the size vat. With these dimensions one can determine the amount of size needed for filling the size vat, the amount of size necessary for the day's run, etc., as it is a very good policy to empty the size vat every night so that fresh size can be used to start the slasher in the morning. The reason for emptying the vat every night is, as mentioned, that size is never as good when re-heated as when it is freshly cooked. The steam used for re-heating it reduces its density, as does water added to it.

Knowing the capacity of the size vat and the amount of size a certain count of yarn will take up, it is easy to determine the amount of size required for a day's run, so that as little will be wasted as possible. Again permit me to say, never add water to the size mixture, especially cold water, if running a little short, to save making up more size. It is better to waste a few gallons. The size man should be taught this, just as he should be trained to weigh his starch accurately, and the ingredients as well, and to measure the water accurately when preparing his mix.

It is a well known fact that yarn will not take up more size than its own weight. We also know that the specific gravity of cotton when air-dried is 1.51, and when bone-dry, it is 1.55. If the size mixture has a specific gravity of from 1 to 1.03, and a gallon of size weighs approximately 8.4 pounds, the following will be found quite useful, and accurate enough, in fact, to use for determining the amount of size necessary to be made up for the time of run desired:

Counts	1 Pound of Yarn	Gals. of Size Required	Counts	1 Pound of Yarn	Gals. of Size Required
22s	"	.168	42s	"	.119
28s	"	.149	45s ST*	"	.114
30s	"	.143	45s CT*	"	.111
34s	"	.134	50s	"	.109
38s	"	.126	55s	"	.103
40s	"	.123	60s	"	.0995

ST, means standard twist; CT, means crepe twist.

Now, let us assume the dimensions of the size vat to be: 13 inches deep, 28 inches wide, and 66½ inches long. The area of the vat is then $66.5 \times 28 = 1862$ sq. in. The volume is $1862 \times 13 = 24{,}206$ cu. in. As there are 231 cubic inches in one gallon, then $24{,}206 \div 231 = 104.8$ gallons, the full capacity of the vat. Dividing the full capacity of the vat by 13, we find that every inch in height will measure 8.06 (let us say 8 gallons to the inch). Now comes the space taken up by the size rolls. These values are approximately as follows: If the rolls are 8 15/16-inch diameter and immersed in the size 1 inch, they will take up the space of 3.6 gallons of size; immersed for 2 inches, they will take up the space of 5.2 gallons; for 3 inches, 6.8 gallons; for 4 inches, 8.4 gallons; for 5 inches, 12 gallons; and for 6 inches, 15.6 gallons. Then, if the rolls are set at 4 inches from the bottom of the size vat, and it is desired to carry the size to about the center of the size rolls or 9 inches from the bottom—the size control instrument is generally placed at this point or a trifle higher—then the size required to fill the vat to this point would be $9 \times 8 - 12 = 60$ gallons. Now, if we wish to slash say 1,851 pounds of 22s yarn in a day, we would require $(1851 \times .166) + 60 = 371$ gallons of size, or 1¾ batches of size when finished at 220 gallons. If the plant is provided with a good storage, then the ¾ batch would be made in the morning, and then followed by two half batches when needed. Remember here that a half batch takes as much time to cook as does a full batch. If no storage kettle is provided, then the size is made in two batches instead of three.

Moisture in Warp Yarn

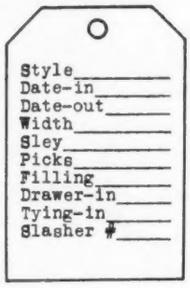
Although a formula has been given for running the slasher at a certain speed to retain the desired amount of moisture in the warp yarn, sometimes a sudden change of atmospheric conditions may affect the formula. One good way to keep a check on this is by feeling the yarn often. The best method is to feel the yarn between the loom beam and the drag roll with the back of the hand. If the yarn is too dry, it will feel warm; if too damp, it will feel sticky and wet—but if the yarn feels cool and is not sticky it is right. Of course it takes practice to obtain the proper feel, but this is one of the most reliable methods.

Another method to check the moisture in the yarn is to weigh the warp to obtain the net weight of the yarn, say every other beam. Then we know that the actual moisture content depends wholly on the net weight after sizing, the average drying temperature in the cylinder, the temperature at which the size is kept, and the speed at which it is dried. From this we deduce the following rule: Add together the net weight of the warp yarn, the average drying temperature, the size temperature, and the speed in yards per minute, divide by 100, and the result will be the actual moisture content.

Slasher Department Records

The slashing department, like all other departments of the mill, requires records as well as reports and test sheets. Although different concerns have different methods to suit their purposes, I will give a few suggestions. In the accompanying illustration, Fig. 9, is a test record for the slasher room, filled out from an actual test as shown.

Another form, Fig. 10, shows a set report which also serves as a record and check for future refer-



Right, Fig. 9, the test sheet; below, Fig. 10, the set report; above, Fig. 11, the warp ticket . . . .

Slasher Room Test Sheet.

Name of Concern here

Address here

Construction of Fabric.

Style 32 Width 90" Sley 64 Picks 68 Counts 21 Twist 4.75x3

Size Formula

168 Gals. Water.
15% Lbs. Gums.
9% " Softener.
10.5 " Starch.

Cook 40 Min. raise. 20 Min. hold.
220 Gals. size Finished.

No. of Beams. 14 No. of Ends. 410 Total Ends. 5740 Size. 8% Moisture 6%

Weather Conditions. Cloudy Outside Tem. 42°F Humidity. 50%

Slasher No.	5
Yds. per Min.	17
Tem. Large Cyl.	242°F
Tem. Small Cyl. 6	252°F
Surface Tem. Large Cyl.	225°F
Surface Tem. Small Cyl.	217°F
Tem. Size in Vat.	185°F
Tem. Incoming Steam.	252°F
Tem. Outgoing Condensation.	248°F
Inlet Pressure.	16 Lbs.
Back Pressure.	1¼"
Air Pressure.	18"
Tem. Sheet entering size vat.	85°F
Tem. Sheet leaving size vat.	148°F
Tem. Sheet arriving on Cyl.	97°F
Area drying surface.	120 sq.ft.
H.P. required to drive slasher	3
Gals. size used in test.	61
Yds. of yarn slashed.	1000
Lbs. of yarn slashed.	357
Steam consumed size vat.	79 lbs.
Steam consumed Cylinders.	319 lbs.
Total Steam consumed	398 lbs.

Test started 10 AM End of Test 11 AM Duration of Test 1 hr.

Date of Test 4-24-33.

Signed J.W.R. Overseer.

ence. This set report is filled out by the overseer and given to the slasher man when the set is put in the slasher. The slasher man fills the right side as the set is running, beam by beam. In the "Beam No." column, the number on the beam head is put down as they are changed on the slasher. He also writes down the number of cuts on each beam and the net weight in pounds in the proper columns. The column for "Moisture Check" is filled in by the overseer several times daily as he checks the slasher man's work. This is filled by using the formula already given, and affords a check on the speed and temperature, which may require changing because of atmospheric conditions, etc. It must be remembered that uniformity in size and moisture increases weaving efficiency. This report is also a means of checking up the work at later dates, and for bad work in slashing. This form, as well as the one to follow, should be on good, strong paper; post-card stock is good.

Slasher Room set Report. Form #1

Date in_____Date out_____
No. of Slasher_____
No. of yarn_____
No. of Beams_____
No. of ends_____
Total ends_____
Style_____
Large Cyl. Tem._____
Small Cyl. Tem._____
Size vat Tem._____
Yds. per Min._____
Cut Gear_____
Lbs. waste back_____
Lbs. waste front_____
Slasher man_____

Beam No.	Cuts	Net Lbs.	Check Moisture

Overseer._____

The warp ticket shown in the form, Fig. 11, is filled out by the slasher man, drawer-in, or tying-in man. One of these is tied to the warp at the slasher. The date-in and date-out are filled in by the person putting the warp in the loom. There are several other forms,

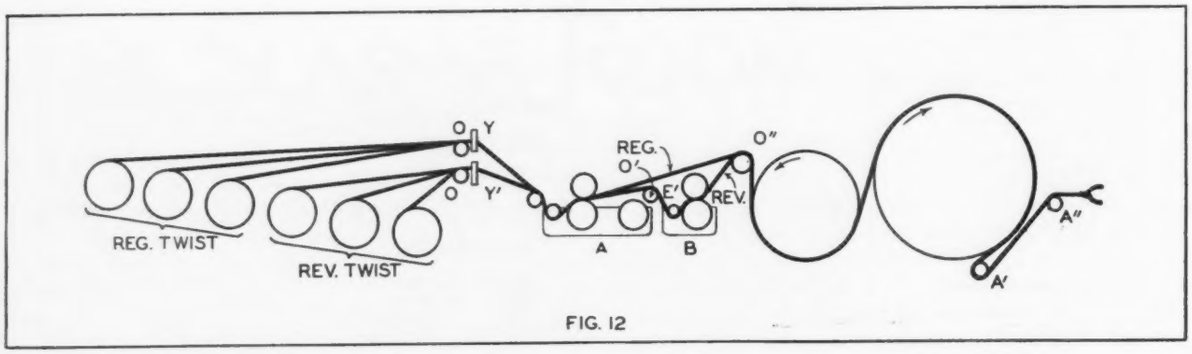


FIG. 12

such as a weekly report, etc., but I am only giving some of those of the most importance, which are useful as a means of checking bad work, and as a reference, especially if the style is repeated at a later date.

Slashing of Cotton Crepe

Much discussion has taken place as to the proper procedure in making a change-over to slash cotton crepe. Back in 1928 the writer first made such a change-over successfully. It is a known fact that this highly-twisted yarn, when wet, will roll considerably if the points between contact of the ribbons formed by the yokes are too great. Many

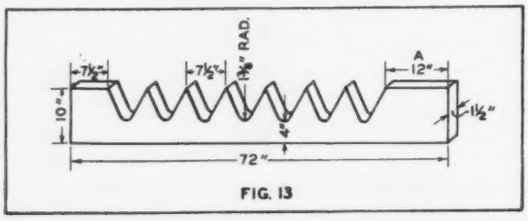


FIG. 13

mills go to the expense of securing an extra size vat, some will install a double size vat, while one can be made cheaper at the mill with just as good results. Too, if the vat is properly equipped with squeeze rolls there is no need of an extra vat; only a little alteration is necessary. Then, too, many mills making this change-over will go to the expense and trouble of fitting the slasher with several brackets and rolls between the size vats and the large cylinder, thinking that there is only one way that the ribbons can be run and that is the way an ordinary sheet for other classes of work is run. My method requires but one carrier roll to install between the box and the cylinder, for sets under 3,000 ends. This method is shown in Fig. 12.

The regular section beam creel can be used successfully, but if replaced by a home-made creel as will be explained, it will be better. Two pieces of 3x4 inch angle iron are secured to pipe standards, one on each side. To these angle irons are fitted the adjustable beam bearings from the regular creel, so spaced that a space of about 1 inch is left between the heads. A creel of this kind affords a means of running the sheet from the beams singly to the guide rolls, as shown in the sketch.

The guide rolls *O* are in stationary bearings, while the yokes *Y* and *Y1* are in adjustable holders. These yokes are constructed as shown in detail in Fig. 13. The 12-inch section *A* of the yoke *Y* is reverse to that of the yoke *Y1*. This will bring the ribbons thus formed by the yokes away from each other, which is essential. Both the regular twist and the reverse twist yarns are sized in the size vat *A*. The reverse yarn is then passed over the guide roll *O1*, which is so set that the yarn will not rub the top or inside of the tint vat *B*. It is then taken to the guide roll *O*. The regular twist is taken direct to the guide roll *O*, from the size vat *A*. The ribbons are then taken together around to the bottom of the small cylinder, over the large cylinder, and to the guide rolls *A1* and *A*, to the split rods.

It will be seen by this arrangement that the yarn is taken to the cylinder immediately, which is desired to prevent rolling of the yarn, and that the rotation of the cylinders is not changed.

Fig. 14 shows an arrangement for separating the size vat, which will also give good results. The yarn is

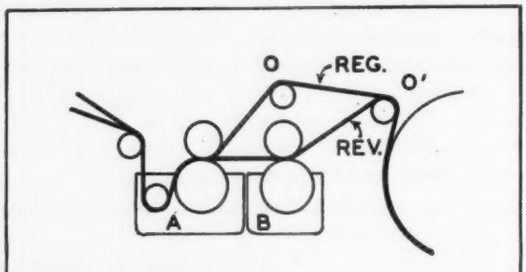


FIG. 14

sized in the compartment *A*, and the reverse yarn tinted in the compartment *B*. The guide roll *O1* is set the same as *O* in Fig. 12. The guide roll *O* is set only high enough to have about 2 inches clearance with the squeeze roll when the latter is raised.

Much trouble is experienced at times with what we call caking. If this caking is closely examined it will always be found coming from the tinted ribbons. The way to overcome this is to keep the tint at a higher temperature and reduce the amount of size added there, too.

When a slasher that is equipped with control instruments is changed over to this class of work, the cylinder temperatures must be changed. That is, the small cylinder is set at the lower temperature and the large cylinder at the higher temperature. A squeeze roll covering that gives good results for the tint yarn is about 20 yards of 16-ounce burlap, and for a top covering, use two or three yards of cloth of light construction.

THE PIONEER--By William P. Jacobs

The third of a series, taken from Mr. Jacobs' new book, and presenting the lives, records and achievements of some Southern textile pioneers . . .

THIS is the third installment reproducing in serial form "The Pioneer", by William P. Jacobs, giving brief resumes of the lives and records of some of the pioneer southern textile manufacturers. The first installment, in July, was devoted largely to the life of Captain Ellison A. Smyth. The second installment, in August, covered the records of D. E. Converse, Leroy Springs, Lewis W. Parker, and D. A. Tompkins.

As a whole, the work presents an inspiring, interesting and valuable record of these textile pioneers. Later installments as reproduced here will cover other contemporaneous textile pioneers . . .

WILLIAM EDGEWORTH BEATTIE

(Mr. Beattie passed away in Greenville, on July 8, 1935, subsequent to the preparation of this sketch.)

On September 25, 1859 there was born a young man in Greenville, South Carolina, who was destined to become one of the most successful cotton mill executives in the South, as well as one of the most astute judges of men: William Edgeworth Beattie, son of Hamlin Beattie and grandson of F. F. Beattie.

His grandfather moved to Greenville from Virginia and entered the mercantile business. His father was also active in the business life of Greenville, and was founder of the First National Bank of that city. It was organized in 1872.

W. E. Beattie, after completing his studies in Greenville, attended Princeton University and graduated with the degree of A.B. in 1882.

After he returned to Greenville from college, his father placed him in the bank, and with characteristic determination, he applied himself vigorously to his task, rising steadily in position and responsibility until after 22 years of faithful service he rose to the position of cashier. During his experience in the bank, he was of course closely associated with his father, who was serving as president. This gave him perhaps his most valued training and experience. The father's keen business intuition was readily absorbed by the son. Much of W. E. Beattie's astuteness and keen insight, which enabled him through life to measure men with such uncanny ability, are directly attributable to the training which he received at his father's hand.

In 1889 Mr. Joe D. Charles, who had served successfully as president and treasurer of the Reedy River Manufacturing Company, died and after his death the mill which is now known as Conestee Mills was bought by Mr. Lewis Parker, Mr. F. F. Beattie and Captain Ellison A. Smyth, and W. E. Beattie was elected president and treasurer. He remained at the same time as cashier of the First National Bank.

At the time, Mr. Lewis Parker of Greenville was president of the Victor Mill at Greer, S. C., as well as other mills, and W. E. Beattie was elected to the directorate.

Meanwhile a vacancy had been created in the presidency of Piedmont Manufacturing Company through the death of Col. James L. Orr. The Piedmont plant was organized in 1874 by Col. Jas. D. Hammett, who served as its successful president for years. Upon his death, Mr. R. L. McCaughrin succeeded to the presidency for a short time, and he in turn passed the reins to Col. James L. Orr, the son-in-law of the founder. Upon the death of Col. Orr in 1905 the record of business management of W. E. Beattie was so outstanding that he was elected president and treasurer. In accepting the position he gave up his position with the Reedy River Manufacturing Company and with the bank.

In 1914 the Parker Cotton Mills Company, a merger of some 16 mills that had been formed three years before by Lewis W. Parker, became badly involved, and W. E. Beattie and M. C. Branch, president of the Merchants National Bank of Richmond, Va., were placed in charge to try to straighten out the financial tangle. The indebtedness of the company was liquidated by disposing of some of the mills in the group, with the result that the remaining properties were saved for the stockholders. In 1916 this group was reorganized under the name of the Victor-Monaghan Company with M. C. Branch as president, and W. E. Beattie as vice-president and treasurer. In 1920 Branch resigned and Mr. Beattie was elected president, and for three years following the company was operated with signal success under his direction.

Adding the spindles of the Victor-Monaghan group to those of the Piedmont organization gave Mr. Beattie command of the second largest group of spindles under southern ownership.

While today Mr. Beattie is retired from the active management of cotton mills, he is still keenly interested in them as in the welfare of the industry at large.

In 1923 he turned over the management of the Piedmont Manufacturing Company to his oldest son, Samuel Marshall Beattie, who displays the same keen business judgment which characterized his father's textile activities. His other major textile interest, the Victor-Monaghan Company, which arose through W. E. Beattie's management and leadership, from the old Parker Cotton Mills Company, is now under the direction of one of the industry's most prominent and most successful executives, Thomas M. Marchant.

Mr. W. E. Beattie, however, still serves as a director of the Piedmont Manufacturing Company, as well as of the Victor-Monaghan Company. He was also, in 1934, a director of the Wallace Manufacturing Company of which his youngest son, William Hamlin Beattie, is president; and of the Marion Manufacturing Company of Marion, N. C. He retired from several boards soon after giving up active work.

He has served as president of the American Cotton Manufacturers Association, director of the Cotton Manufacturers Association of S. C.; as president of the Kiwanis Club of Greenville; as president of the Cotillion Club of Greenville; as vice-president of the old Sans Souci Country Club of Greenville, and has been a member of a number of other prominent clubs in Greenville, Asheville and New York.

One of the foremost features of Greenville to attract the attention of a visitor is the well paved streets of the city. This was another of Mr. Beattie's activities, inaugurated back in 1911 when he was chairman of the paving commission. He took much interest in

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this work as he felt it would be of great value to the city and its people.

During the war period Mr. Beattie was appointed by President Woodrow Wilson to serve on a committee to investigate whether or not it would be wise to fix the price of cotton, and, it will be remembered, this was not done.

Mr. Beattie is an active member of Christ Episcopal Church of Greenville, and for many years served as junior warden and then as senior warden of that institution.

In 1885 he married Miss Kitty Marshall, daughter of Dr. Samuel S. Marshall. His wife died in 1930. There are three children, Samuel Marshall, William Hamlin and Elizabeth Cleveland, and there are seven grand-children.

Mr. Beattie's Personal Characteristics

Mr. Beattie's characteristics include more than ordinary business foresight and a rather unusual intuitive development which frequently enables him to feel rather than know the causes that lie behind certain actions on the part of others; and his first impressions, while sometimes apparently hasty, are quite likely to be correct and are usually safe. He is persistent in his efforts, competent in the performance of any duties he may undertake, and can be counted upon to finish in a careful and conscientious way any project upon which he starts.

He is extremely approachable and never too busy to give due consideration to those who seek him. While he will listen with impartial patience and carefully weigh all the facts presented, his conclusions, though perhaps frequently tempered by leniency or charity for what he considers the weakness of the man or his argument, are again strongly influenced by his intuitive judgment as to the proper course to take.

A quiet, courteous, lovable man, Mr. Beattie is thoughtful and considerate of those more or less dependent upon him, unaffected and unostentatious in his business relations, but resolute and resourceful in attaining his objective. His sharp, penetrating eyes, with innumerable tiny lines radiating from the corners to reinforce the glint of humor which occasionally becomes visible therein, furnish a most potent index to his character; a much more reliable indicator than anything he says—because, usually, he doesn't say it.

Few men in the cotton manufacturing industry have developed the great host of friends that it has been Mr. Beattie's good fortune to gather.

Wherever cotton manufacturers gather he can be seen the center of a large group of devoted friends.

His good nature, his tact, his pleasing personality have made him one of the best loved men in the industry.

While it has not been his good fortune to launch out into the dark and build cotton mills in undeveloped territory, his work in developing the Piedmont Manufacturing Company to its position as one of the leading sheeting mills in America, and his judgment in handling the organization of the Victor-Monaghan Mills, mark him as a true pioneer as well as a most capable business man. Mr. Beattie knew how to work and put every ounce of his energy into attaining his aims. But he possessed characteristics far more valuable than a mere exemplification of personal efficiency. He knew how to inspire others into doing their best for him. In this respect he has no peer. In this ability lies no small portion of his unusual success.

The records of the development of cotton manufacturers as well as cotton manufacturing in the South will reflect the handiwork of William Edgeworth Beattie and set him apart always as one of the great pioneers of the early years of the industry. Like Smyth, Orr, Parker and other textile pioneers with whom he was associated, he, upon retirement, left the industry much farther advanced than when he entered it.

EDWIN MICHAEL HOLT

Few men have had such a wide-spread influence over the development of the cotton textile industry as did Edwin M. Holt (1807-1884).

Beginning as he did early in the development of textiles, his contribution to the early developments of textiles in the South was most important.

He enjoyed the distinction of "casting his mantle" upon seven worthy sons, five of whom with their sons and successors later played a most important part in spreading successful industrial development throughout the South, for while the efforts of Edwin M. Holt were largely confined in the beginning to Alamance County in North Carolina, the influence steadily spread and gave rise to the establishment of cotton mills throughout the Carolinas.

He was a resourceful man of courage and vision, and his life was permeated with the pioneering spirit.

To Edwin M. Holt is due the honor of building the first colored cotton fabric manufacturing plant in the South, the old Alamance Mill, in 1837.

For the following outline of his activities and those of his successors, the author is indebted to Mr. J. Harvey White, one of the descendants of Edwin M. Holt, who is now president of the Travora Manufacturing Company of Graham, Alamance County, North Carolina.

Under date of January, 1849, there apepars in Lossing's Pictorial Field Book of the American Revolution, Volume Two, Page 388, the following:

"I left the place of Pyle's defeat toward noon, and, following a sinuous and seldom-traveled road through a forest of wild crab apple trees and black jacks, crossed the Alamance at the cotton factory of Holt and Carrigan, two miles distant. Around this mill quite a village of neat log-houses, occupied by the operatives, were collected, and everything had the appearance of thrift. I went in, and was pleased to see the hands of intelligent white females employed in a useful occupation. Manual labor by white people is a rare sight at the South, where an abundance of slave labor appears to render such occupation unnecessary; and it can seldom be said of one of our fair sisters there, 'She layeth her hands to the spindle, and her hands hold the distaff.' This cotton-mill, like the few others which I saw in the Carolinas, is a real blessing, present and prospective, for it gives employment and comfort to many poor girls who might otherwise be wretched; and it is a seed of industry planted in a generous soil, which may hereafter germinate and bear abundant fruit of its kind in the midst of cotton plantations, thereby augmenting immensely the true wealth of the nation . . .

"This factory, in the midst of a cotton-growing country, and upon a never-failing stream, cannot be otherwise than a source of great profit to the owners. The machinery is chiefly employed in the manufacture of cotton yarn. Thirteen hundred and fifty spindles were in operation. Twelve looms were employed in the manufacture of coarse cotton goods suitable for the use of the negroes!

"At that time, the condition of the landless white man in Piedmont, North Carolina, was pitiable. He had only his labor for sale, and that was in competition with slave labor. If he was fortunate enough to have a trade, the wages were exceedingly meagre, and the slave competition still existed. In February, 1846, we find an entry in the diary of the late E. M. Holt: 'Thomas Miller commenced work at five dollars per month.' This probably included board. Another entry read: 'Hired boy, Harvey, of Mrs. Freeland's at fifty dollars for the year.' This was evidently a negro slave.

"The working woman at that time had no oppor-

tunity for employment except in domestic service, if it could be found, work in agriculture or in the handicrafts. The agricultural work was exceedingly laborious; for example, in binding wheat after the cradlers, women would come from the fields with their wrists raw and bleeding from the cuts of the stubble. The wages of a woman in domestic service were a dollar a month and found payable in corn, wheat or other farm products.

"Conditions were so intolerable that thousands emigrated to the West where they secured free land. In 1850 one Congressman from Indiana stated that one-third of his constituency was composed of either natives of North Carolina or sons of North Carolinians.

"It was under such conditions that cotton manufacturing was begun in North Carolina, first by the Schencks in Lincoln County, later by the Battles and others.

"In 1836, Mr. Henry Humphrey was operating a cotton mill in Greensboro, known as the Mount Hecla Steam Cotton Mill.

"At that time, Edwin Michael Holt (born January 14, 1807—died May 14, 1884), son of Michael Holt, Second, who represented his county in the Legislature in 1804, and grandson of Michael Holt, First, who was one of the Magistrates under the Crown before the Revolution, was running a farm and country store in the western part of Orange County. (His home was in the present County of Alamance.) He frequently visited Greensboro, and became well acquainted with Mr. Humphrey. Being of mechanical turn of mind, he was very much interested in the cotton mill. In 1837, in partnership with his brother-in-law, William A. Carrigan, he erected the Alamance Factory, Holt and Carrigan, proprietors, on Alamance Creek, with five hundred and twenty-eight spindles. The machinery was bought from Goodwin Clark & Company, Paterson, New Jersey. Additional machinery was installed in 1845. Under date of March 26-27, 1845, Mr. Holt enters in his diary the following:

" 'Wednesday 26—arrived in New York. Went to Paterson.

" 'Thursday 27—Bought of C. Danforth 528 spindles and preparation and returned to New York in the morning.' "

"The mill was lighted by whale oil lamps (though they later tried out camphene lamps) and was heated by wood-burning stoves. They worked twelve hours a day, and wages were approximately twenty-five cents a day for women and forty cents for men; children worked for ten to twenty cents. The product was at first bunch yarn put up in five-pound bundles, and was either sold to peddlers to be peddled out through the country, or hauled by wagons to various towns for sale as hand-knitting yarns or weaving yarns for hand looms. Some yarns were shipped to Philadelphia, going by wagon to Petersburg and thence by packet.

"Later eight or twelve looms were added to the equipment to weave osnaburgs for negroes.

"Edwin M. Holt had seven sons, of whom Alfred, the eldest, and Alexander, the fourth, were not identified with the cotton mill business.

"In 1850, Mr. Carrigan decided to move to Arkansas, and sold out his interest in the partnership to E. M. Holt.

"Thomas M. Holt, one of his sons (born July 13, 1831—died April 11, 1896) who was afterwards Governor of North Carolina, was then twenty years old, living in Philadelphia learning business methods. His father recalled him and put him to work in the mill after Mr. Carrigan's departure.

"In 1853, a Frenchman, traveling through the country, and who was a dyer, stopped at the mill and offered to teach them how to dye yarn for the sum of one hundred dollars and his board. Mr. Holt accepted this offer and, securing an eighty-gallon copper boiler (used for cooking turnips for cattle food on the farm) and a cast iron wash pot, started with this equipment to dye yarns for sale. Later full dye equipment was secured, four box looms installed and the manufacture of Alamance plaids began.

"Writing in 1895, Governor Holt states:

" 'I am reliably informed that up to that time there had never been a yard of colored cotton goods woven on a power loom south of the Potomac River. If this be true, I am entitled to the honor of having dyed with my own hand and woven under my own supervision the first yard of colored cotton goods manufactured in the South.'

"In 1860 the Alamance Mill had twelve hundred spindles and ninety-six looms making plaids.

"In 1845 a mill was started at Haw River, North Carolina, with five hundred and twenty-eight spindles. This failed in 1858 and was bought by E. M. Holt and his son, Thomas M. Holt, at the sheriff's sale. In 1860 Thomas M. Holt bought his father's interest in this mill and operated it as the Granite Cotton Factory very successfully until his death in 1896. In 1895 the mill had twenty-two thousand, eight hundred and thirty-four spindles and nine hundred and forty looms all on colored goods. This mill continued in the hands of his sons and sons-in-law until 1920, when it was sold.

"Governor Holt also was largely engaged in farming at the celebrated Linwood Farm near Lexington, North Carolina.

"James Henry Holt, third son of E. M. Holt (born April 22, 1833—died February 13, 1897), received his early training at the Alamance Mill, and also as cashier of the Bank of Thomasville, North Carolina. He served as a private in the 10th North Carolina Artillery during the War Between the States. In 1867 he and Capt. Williamson superintended the building of the Carolina Cotton Mills, near Graham, North Carolina, for E. M. Holt, and in 1880 in partnership with his brother, W. E. Holt, built the Glencoe Mills near Burlington, North Carolina. He was very successful in the different enterprises, and as his sons grew up he helped and encouraged them to go into the cotton mill business. Walter L. Holt and his brother, E. C. Holt, sons of James Henry Holt, built the Elmira Mill in 1886. James Henry Holt, Jr., and Walter L. Holt built the Windsor Mills in 1890, and a few years later Walter L., E. C. and Samuel M. Holt built the Lakeside Mills at Burlington. In 1897 Mr. W. L. Holt moved to Fayetteville and became associated with Mr. Sam Morgan and others and built the Holt-Morgan Mills. Shortly after E. C. Holt moved to Wilmington and was associated with the Delgado Mills. After his father's death, R. L. bought his father's and uncle's interests in the Glencoe Mills.

"William E. Holt, fifth son of E. M. Holt (born November 1, 1839—died May 26, 1917) received his early instruction at the Alamance Mill. After his father's death in 1884, the Alamance Mill, with the Carolina Mills, which were owned by E. M. Holt, became a partnership, composed of his five sons engaged in the cotton industry and one of his daughters, under the firm name of E. M. Holt's Sons with Mr. W. E. Holt as manager of the plant. In 1887 Mr. Holt moved to Lexington and there built the Wennonah Mills. Later he moved to Charlotte and became the president of a little weaving mill then known as the Highland Park Manufacturing Company. He took this plant and, with the assistance of Mr. J. S. Spencer and C. W. Johnston, built it up into the present Highland Park chain of mills. Mr. Holt retired from the management of the Highland Park Mills in 1905. He held large interests in a number of other cotton mills. At one time he was president

of the Commercial National Bank in Charlotte, of which he and his brothers and sisters held the controlling stock for a good many years. His son, W. E. Holt, Jr., is now president of the Wennonah Cotton Mills at Lexington. His nephew, C. A. Hunt, Jr., whom Mr. Holt trained in his office, is president and general manager of the Dacotah Mill in Lexington, and his brother-in-law, C. A. Hunt, Sr., has been associated with Mr. Holt, in the Nokomis Mills in Lexington, which is now a part of the Erlanger group.

"Linn Banks Holt, sixth son of E. M. Holt (born June 28, 1842 — died October 25, 1920), served through the War and was seriously wounded and captured at Fort Harrison near Richmond. At the close of the War, he returned home to work on his farm and received his business education at the Alamance Mill. In 1879, with his youngest brother, Lawrence S. Holt, he built the Bellemont Mill near Graham. After his father's death in 1884, he moved to Graham and bought the original Sidney Cotton Mill, which was built in 1881 by Scott and Donnell. He greatly enlarged this mill and re-named it the Onieda Cotton Mill. This mill is still owned by his descendants and is operated by them today. In addition, he had interests in the Altamahaw Cotton Mill, owned by Holt, Gant and Holt, in the E. M. Holt's Sons partnership, in the E. M. Holt Plaid Mills, the Asheville Cotton Mill, Leaksville Cotton Mill and the Minneola Mills. He was very much interested in fine horses and at one time owned a very extensive racing stable.

"Lawrence S. Holt, born May 17, 1851, and still living, the seventh son of E. M. Holt, received his early training in business in Charlotte, North Carolina, under Colonel Lewis Williams and Mr. McLaughlin. After his marriage to Margaret Erwin of Morganton in 1872, he moved back to Alamance and went to work for his father at the Alamance Mill. In 1879, in partnership with his brother, L. B. Holt, he built the Bellemont Cotton Mill. In 1886 he moved to Company Shops (now Burlington) and bought the LaFayette Mill, which name he changed to the Aurora Cotton Mill. This mill he greatly enlarged and ran on ginghams exclusively for a good many years. After his sons, Erwin A. Holt, Eugene Holt and Lawrence S. Holt, Jr., became of age, he took them in partnership with him under the name of Lawrence S. Holt and Sons. This partnership later bought the Gem Mills at Gibsonville, which they still own. Eugene Holt is largely interested in the Spencer Love group of mills known as the Burlington Mills—on silk and rayon.

"In 1885 L. Banks Holt, Lawrence S. Holt and his brother-in-law, John Q. Gant, who received his early training at the old Alamance Mill under E. M. Holt, built the Altamahaw Mills. Later Mr. Gant built the Glen Raven Mills. Both the Altamahaw Mills and the Glen Raven Mills are now owned by Mr. Gant's sons.

"In 1884 Mr. L. Banks Holt, Mr. Lawrence S. Holt and his brother-in-law, Mr. W. A. Erwin, and Capt. W. H. Turrentine, built the E. M. Holt Plaid Mills. This was operated by W. A. Erwin until he was called to Durham by the Duke interests to build the Erwin Cotton Mills. He sold his interest in the E. M. Holt Plaid Mills to his brother, J. Harper Erwin, who also went with the Dukes later on. When J. Harper Erwin left he sold his interest to Lynn B. Williamson, a grand-nephew of E. M. Holt, who now operates this mill much enlarged, on silk and rayon fabrics, also knit goods.

"E. M. Holt had three daughters. Fannie A., the eldest, married Dr. John L. Williamson of Caswell County. The second, Mary E., married Capt. James N. Williamson of Caswell County, North Carolina, and the third, Emma V., married Capt. James W. White of Fort Mill, South Carolina. In 1871 E. M. Holt bought the Saxapahaw Mills, built by Jonathan Newlin and Sons in 1849, and made a proposition to his two sons-in-law, Dr. J. L. Williamson and Capt. J. W. White, that if they would put in one-third of the quick assets in a partnership formed by himself, he would form a partnership composed of himself, Capt. White and Dr. Williamson known as Holt, White and Williamson, and they would share equally in the profits and that at his death the wives of Dr. Williamson and Capt. White would receive each one-third of the real property of the mill. The two sons-in-law accepted this proposition, and they assumed management of this mill.

"When Mr. E. M. Holt died in 1884, he left the third of the partnership which he held in his name to Ben J., George T. and Edwin H. Williamson, sons of Dr. John L. Williamson, and the partnership continued in the name of White, Williamson & Company instead of Holt, White & Williamson.

"In 1898 E. H. Williamson moved to Fayetteville, and, with Mr. W. L. Holt and others, built the Holt-Williamson Manufacturing Co.

"The other sons of Dr. John L. Williamson to engage in cotton manufacture were Lawrence A. Williamson at the Holt-Morgan Mills in Fayetteville, Finley L. Williamson at the Holt-Granite Manufacturing Company in Haw River, J. Walter Williamson at the Delgado Mills and the Belleville Mills in Wilmington, and L. Banks Williamson with the Glencoe Mills near Burlington.

"The partnership was incorporated in 1906 under the name of White, Williamson & Company, under which style it was continued until the mill was sold to other interests in 1927.

"J. Harvey White (son of Capt. Jas. W. White, who got his early training under his uncle, Mr. W. E. Holt, at the Wennonah Mills at Lexington and at the Alamance Mills and afterwards as representative of his mother in the partnership of White, Williamson and Company), with his two brothers, William E. White and E. H. White, and his mother, started the Travora Manufacturing Company at Graham and Haw River in 1901.

"The second daughter of E. M. Holt, Mary E. Holt, married Capt. James N. Williamson of Caswell County and, upon the insistence of Mr. E. M. Holt, they moved to Alamance. In 1882 Capt. Williamson built the Ossippee Mills, and after his two boys, William H. Williamson and James N. Williamson, Jr., finished their education, he took them in partnership with him under the firm name of James N. Williamson and Sons. In 1892 Capt. Williamson and his son, William H. Williamson, and son-in-law, O. H. Foster, built the Pilot Mills of Raleigh, North Carolina. In 1907 he and his sons bought the old Big Falls Mill near Burlington, renaming it the Hopedale Mills.

"These all retired from the cotton manufacturing industry in 1919, except Mr. Foster, who had retired in 1894.

"You will note from the above account that E. M. Holt and the men trained by him had all the individualism of the true pioneer. Five of Mr. Holt's sons branched out and built a mill either alone or in partnership with one of his brothers. When their sons grew up they, in turn, went into the cotton mill business with a small mill managed individually. As we look at it now, this was not good economics. It was probable that had they incorporated one or more large companies and united their efforts they would have dominated the colored goods industry in the South for a good many years. Be that as it may, the course they took threw responsibility on the younger men as they came on, and thus helped to develop them.

"The early mills were located on small streams, and were frequently driven by overshot waterwheels. As the mills grew larger, improved wheels

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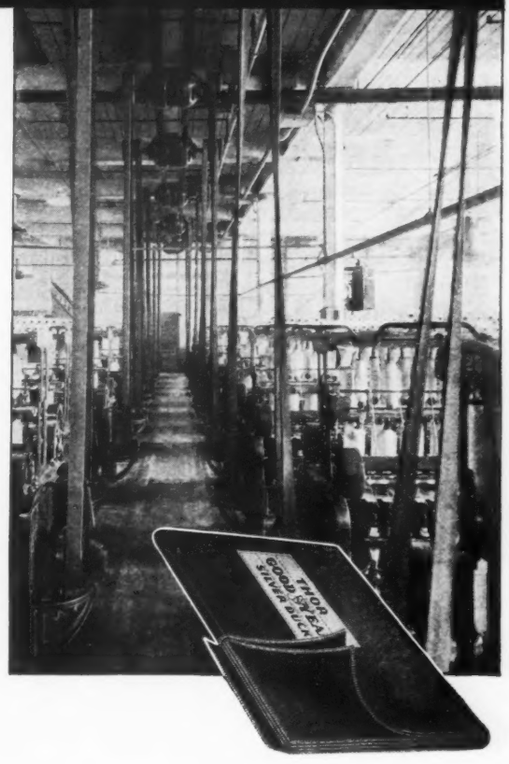

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Goodyear is represented in the South by authorized Goodyear Mechanical Rubber Goods Distributors conveniently located with relation to your mills and able to supply promptly all Goodyear Mechanical Rubber Goods for the textile industry

**Made in standard widths up to and including 18"-7 ply; special construction available in larger sizes*

THE GREATEST NAME IN RUBBER
GOODYEAR TEXTILE BELTING

were installed and auxiliary steam plants added.

"As stated above, the goods manufactured consisted almost entirely of Alamance plaids with each man selling his own goods. As was to be expected, this led to very fierce competition among themselves and with other mills of the State, with the result that the market for these goods got very much demoralized.

"In 1891 Moses Cone and his brother, who had been selling goods for the Asheville Cotton Mills, made a proposition to the various mills that they allow the Cones to sell their out-put of plaids, guaranteeing the accounts, for five per cent commission, the mills to give them the exclusive sale for five years. After considerable delay and discussion, most of the colored goods mills in North Carolina signed this contract with the Cone Export & Commission Company, and thus was born the 'plaid trust', so named by the politicians in the early nineties.

"In 1892 Mr. W. A. Erwin left the E. M. Holt Plaid Mill in Burlington to build the Erwin Cotton Mills in Durham. Like all the other mills on colored goods in this section, this mill was built to make plaids, and Crompton & Knowles box looms were installed. The Cone Export & Commission Company were selling agents. They found that there was a growing demand for denims in the South and induced Mr. Erwin to begin making them. Mr. Erwin quickly found that he could not make them satisfactorily on Crompton & Knowles looms, so installed plain looms and then later Draper automatic looms. In 1896 Mr. Erwin changed his account. This left the Cone Export & Commission Company without a denim mill to supply the large demand which had been built up. therefore, in 1895, Mr. Cone and his brothers built the Proximity Mills in Greensboro, which has become one of the largest denim manufacturers in the world.

"The above is an outline of the cotton mill industry as built up by E. M. Holt and his associates. Some of these mills have gone out of existence; a number of them have gone into the hands of other people; a good many of them have changed the product to rayon or silk weaving or knitting; some of them are enlarged and improved but still run on cotton goods. They are giving employment to a great many thousands of operatives and, as prophesied by Lossing in his Field Book, have proved 'a real blessing, present and prospective, for it gives employment and comfort to many poor girls who might otherwise be wretched.'

"The original Alamance Mill is still in operation. In 1905, Mr. L. Banks Holt bought out the interests of the other partners in this little mill and, when he incorporated the L. Banks Holt Manufacturing Company, this became one of the units. Mr. Holt died in 1920, and in 1927 his heirs sold the old Alamance Mill out of the family to John Shoffner, who started as a doffer boy in this mill. Mr. Shoffner with John Black, his brother-in-law, who had been an overseer in the mill, had started a little knitting mill a few years previous in the edge of the village. This had been very successful and, as they wanted to enlarge, they bought out the original mill and are still operating it as a corporation under the name of Standard Hosiery Mill, which at present is capitalized at $635,000.00."

Thus we chronicle briefly the accomplishments of a true pioneer and his descendants. Few men, if any, have influenced the building of so many cotton mills as did Edwin Michael Holt. As much as any one man, he can be truly called the Father of Cotton Manufacturing in North Carolina.

(To Be Continued)

June Inventories of Hosiery Lower Than Last Year's

Shipments of hosiery from American mills during the first six months of the current year, amounting to 53,000,000 dozen pairs were practically the same as shipments during the corresponding period of last year, according to the statistical bulletin of the National Association of Hosiery Manufacturers, published on August 9. Production, on the other hand, amounting to 54,600,000 dozen pairs, was about one and a quarter per cent lower than it was a year ago. Inventories as of June 30 this year, largely as a result of closer gauging of production to shipments, were lower than they were a year ago at the same time by more than one per cent, amounting to 18,650,000 dozen pairs.

These figures are based on data secured from 622 companies operating 807 plants throughout the country.

As is usual during the first six months of the year, production exceeded shipments during the half-year period for both 1934 and 1935. The bulletin points out that this condition is in line with sound policy, as review of past experience shows that second-half shipments usually exceed those of the first half-year. A judicious building up of stocks during the first half of the year, therefore, serves to level out the production curve for the year.

The major portion of the excess of production over shipments occurred in the full-fashioned branch of the industry, where shipments themselves exceeded those of a year ago. The excess of production over shipments in the seamless groups was much lower than in the full-fashioned group, there being actual declines in inventories in several cases. In fact a marked improvement is shown in the case of men's half-hose, which now finds itself in a very satisfactory statistical position.

Production for the month of June was 7,000,000 dozen pairs, representing a sharp drop from both June of a year ago and May of this year. Shipments for the month, amounting to 7,500,000 dozen pairs also represents a marked drop when compared with the other two months mentioned. It will be noted that shipments exceeded production during June of this year by 500,000 dozen pairs, which is a reversal of the condition prevailing last June.

Of this year's June production, 2,500,000 dozen pairs were full-fashioned and 4,500,000 pairs were seamless.

Employment during June was reported as less than one per cent lower than during May, despite a decline of 23 per cent in production. This indicates a determination on the part of manufacturers not to lay off their workers, but to distribute such work as is available among existing personnel as widely as possible.

A comparison is made of production statistics with retail statistics prepared by the controllers' congress of the National Retail Dry Goods Association. This shows that retailers build up their stocks for the Christmas selling period gradually. This enables manufacturers to spread their production out instead of concentrating it during the Fall months.

MonoRail Appoints Easley

Curran S. Easley, Box 755, Greenville, S. C., formerly associated with the Callaway Mills of LaGrange, Ga., but more recently a manufacturers' agent in Greenville, has been appointed district representative for The American MonoRail Company, Cleveland, Ohio, covering Georgia and the Carolinas.

Announcing . . .

THE NEW ARMSTRONG'S *Extra cushion* SEAMLESS CORK COT

Made under the exclusive Armstrong* TUBULAR PROCESS, *this new cork cot brings you 6 definite advantages

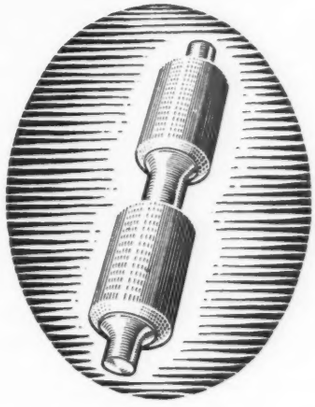
TWENTY years ago, Armstrong pioneered the first cork roll covering for the textile industry. Since that time cork cot acceptance and cork cot improvements have gone hand in hand until now more than 25% of the nation's spindles are on cots made by Armstrong. With the introduction of the new Armstrong's *Extra Cushion* Seamless Cork Cot, an era of even greater roll efficiency and savings is offered.

* * *

Armstrong's *Extra Cushion* Seamless Cork Cot is vitally important to you because of these six definite advantages:

(1) *Spins better yarn*—The extra cushion and uniform density from end to end of this new cork cot provides a better line contact with the bottom roll at all times, thus insuring a stronger, more uniform yarn.

(2) *Reduces end breakage*—The "comeback" of the new extra cushion cot means less end breakage and better running work. Tests show a reduction of end breakage of from 20% to 50% as compared with other types of roll coverings.



(3) *Improves Monday morning start-up*—Thanks to the uniform density and end-to-end strength as well as to the extra cushion which insures better alignment under all temperatures and atmospheric conditions, this new cot is a big help to those mills with cold dry rooms at start-up time on Monday mornings.

(4) *Works satisfactorily on old frames*—Where equipment is worn or damaged—with steel rolls somewhat out of true—the extra cushion of this new cork cot takes better care of these irregularities and produces a quality yarn with a minimum of end breakage.

(5) *Handles more easily in changing numbers*—Because this new cot has little tendency to hollow out—and has no hard shoulders to prevent proper contact—mills making frequent changes of numbers will find it a distinct advantage. Any normal range of numbers may be handled without premature buffing.

(6) *Stands up under abuse*—The new extra cushion cot is stronger and tougher, and has more "comeback." For these reasons, it will not groove readily from hard ends and is less affected by top roll laps.

* * *

The six important advantages of Armstrong's *Extra Cushion* Seamless Cork Cot are made possible by an entirely new and different process of cork cot manufacture. An exclusive development covered by patents, Armstrong's new *tubular process* insures absolute control of cot uniformity from end to end and makes possible this extra cushion and strength. In addition, all operations are carried on in rooms in which both temperature and humidity are accurately controlled, thus insuring still greater uniformity.

A number of field tests conducted during the past two years have demonstrated the six advantages of this new cork cot. These tests have proved that the new extra cushion cork cot spins a better, more uniform yarn with less end breakage.

Today—write for complete details about these tests and about the new Armstrong's *Extra Cushion* Seamless Cork Cot.

Armstrong Cork Products Company

Textile Division, 923 Arch Street

Boston, Mass. *Lancaster, Pa.* *Greenville, S. C.*

CURRENT TEXTILE TOPICS ....

Talk of the Month

PRIVATE enterprise in August kept up the promise of July in the national business, with consequent stimulation of activity in the cotton industry. The muddled political situation continued with the extension of the Congressional session, but summer consumer buying of retail merchandise was assuring and led to more confident preparation for the fall business. On all sides the reports of business men have been more than hopeful regarding the fall and they are even looking ahead to spring as another favorable period. In the textile industries the hopes are increased, perhaps, by the fairly consistent rule of the cycle.

National business promising despite political muddlement

Among the encouraging reports of the past month, prominent was that made by Flint Garrison, director-general of the Wholesale Dry Goods Institute. He summarized the outlook as far better than that a year before, both for volume of business and for the prospect of rather better prices. The summer brought a tendency of mills to get away, incidentally, from prices that were not only unprofitable but certain to bring bankruptcy if indefinitely continued. The mills were well placed at mid-summer to take a firmer stand by reason of the long period of curtailment and the cumulative requirements among buyers of goods.

For the cotton industry, there still remains the unfortunate condition of uncertainty from one cause after another arising to muddle the process of doing business. The very success of the Hoosac Mills in its suit for testing the constitutionality of the processing tax became an obstacle to normal trading just when the mills were in line for a broad pick-up of business in July. The industry now must wait, patiently or otherwise, for the final adjudication of the issue by the Supreme Court.

This leaves the manufacturers an interim period of doing business with provisions for adjustment in accordance with the last court decision. During the interim—which will last to around Christmas time if forecasts on the final test are correct—the mills should do a large business, based on several fundamental conditions enumerated by Mr. Garrison. In brief, he noted that the farmer's income will be greater and likewise industrial payrolls; he cited the index of retail trade all over the country as substantially above that in 1934 and still rising; finally and "possibly most significant", is the $4,800,000,000 Emergency Reemployment Fund.

While mills may be able to get a good volume of turnover at some increase of prices, the results of the second half of the year will be complicated by the adjustments. The outlook for AAA program at the time of writing was also an uncertainty faced by the mills and prospects regarding prices of the crop were uncertain. The announcement by Oscar Johnston, manager of the Cotton Producers' pool, late in July that the government had a "corner" on the surplus of American staple created little impression on the trade; at least, it was met by a drop in the price and the government's August forecast was the signal for a sharp adjustment of the market.

It might be possible for a government, or a group of nations, to effect a restriction of output in agriculture. So far that has been attempted, with partial success in some international agreements in a time of depressed prices. But to sustain an artificial level of prices by "control" of a large surplus is well demonstrated as a futile undertaking. And since the government has not been able to control nature, its efforts to restrict the cotton crop by limiting the acreage have been partly negative. Thus the cornering of a surplus—incidentally a move which in private practice is condemned—bade fair to leave the government holding the bag for cotton farmers. A corner may squeeze speculators, but in the long run it breaks of its own weight and commodity buyers always discount the inevitable in such moves.

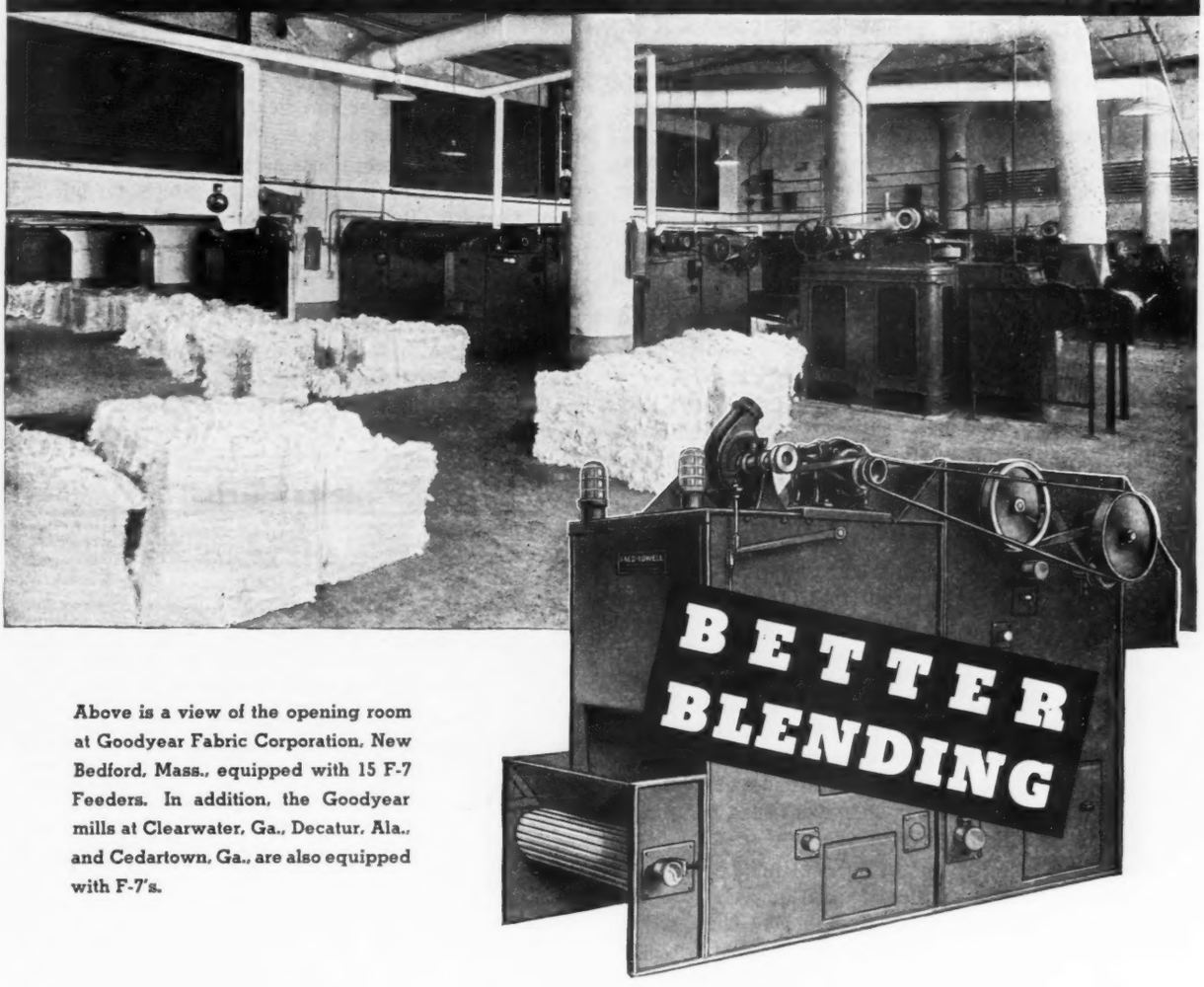
One of the things that inspired leaders in the cotton industry to begin demanding higher prices was the Federal Trade Commission report on its investigation extended to the end of 1934. At the time of the F. T. C. report early this year on mill results for 1933, for the first half of 1934 and July-August, 1934—or to the time of the strike—the trade claimed that the September-December results would be further conclusive of the unprofitable nature of operations except for a short time under the labor and other conditions imposed by the NRA regulations, which the industry has voluntarily continued. These claims have been substantiated by the "extended" report issued in the past month.

AUGUST progressed with mixed experience for the cotton mills of New England. The prospects were generally improved as to business in cotton goods, but once again serious labor conditions marred the prospects, with a strike in the Naumkeag plants, a leading unit. On the favorable side one company was so impressed with the upward turn of the tide early in August that it was decided to more than double the working force. This was the York Manufacturing Company of Maine, which increased its employees from 300 to 700, at Saco. This company, which also has mills at Lewiston and Augusta, expressed through its agent a confidence that the improvement of textile conditions would warrant the large increase. Fine goods mills in other cases were getting relief from months of poor business.

New England Mill Situation

Steps toward profitable operation were taken by leading companies, following the long period in which

TODAY'S COTTON DEMANDS BETTER BLENDING



Above is a view of the opening room at Goodyear Fabric Corporation, New Bedford, Mass., equipped with 15 F-7 Feeders. In addition, the Goodyear mills at Clearwater, Ga., Decatur, Ala., and Cedartown, Ga., are also equipped with F-7's.

The F-7 Provides BETTER BLENDING

Carefully managed mills are today using F-7 Feeders in place of bale breakers. The blending is vastly superior, and an important cleaning operation is added. Write for "F-7 Feeder Bulletin."

SACO-LOWELL SHOPS — BOSTON

CHARLOTTE GREENVILLE ATLANTA

F-7 CLEANING & BLENDING FEEDER

market and outside conditions were productive of losing rates. The selling agents for the Amoskeag Manufacturing Company of Manchester, N. H., hit sort of a keynote for the industry in announcing the first of what it was forecast would be a rising movement of prices for the lines of that prominent unit. In a statement announcing an increase of five per cent, allusion was made to the Federal Trade Commission findings of heavy losses for the last half of 1934 and then followed:

"The published financial statements of several mills for the first six months of 1935" make it "obvious that the industry generally has not succeeded in passing on its costs of production, including the amount of the processing tax, to its customers. Continued losses of this nature would lead only to bankruptcy and further difficulty in maintaining wage and hour standards. We believe there is a responsibility on the individual mills and selling agents in definitely working toward profitable operations."

Conditions had come to such a serious pass, however, that Governor Bridges of New Hampshire stated around mid-August that this largest unit of its kind in the world in 90 days might fold up and move out of Manchester. In such a crisis, the workers of the Naumkeag Steam Cotton Company, of Salem and Peabody, Mass., took occasion to strike for higher wages, notwithstanding that they were receiving the best rate of any textile mill in the world and the work assignment was far below the average for mills making similar products, as stated by the management. It was also stated that the demands were such as to ruin the mills and kill the jobs of the workers.

Lack of Federal co-operation, continued restrictive legislation by State, municipal taxation and irresponsibility of labor all have contributed to the further harrassment of the cotton industry in New England this year. A little ray of hope on municipal taxation developed in Rhode Island at mid-summer, when a judge of the Superior Court ruled that the Lawton Spinning Company of Woonsocket had been over-assessed for 1933 and 1934, the evidence showing that the depression was cause for lower valuation of mill properties. It was found further that the cotton textile business in New England has been in a declining state since 1920 and that the decline was continuing.

In spite of the public agitation on behalf of salvaging the industry ensuing from the strike last fall and in the face of evidence that the mills were facing unbearable burdens in Massachusetts, the State legislature has imposed this year new restrictions where the Commonwealth already was the most exacting in the country. One new burden is a 10 per cent surtax on corporation taxes. As a leading student of the State economic position, Col. Charles R. Gow, says: "If the lessons of Fall River, Southbridge, Millville and many other communities now on the verge of economic disaster do not carry conviction to the minds of our people as to the absurdity of the policies which they have pursued in the past, there is little ground for hope as to the future of this State as a place in which to live and work."

It is reported that in Rhode Island, during the year ended 1935, a loss of 324,486 ring spindles, 43,210 mule spindles and 1,800 twister spindles was sustained; also 10,188 looms and nearly 1,000 cards. This represented 24 to 30 per cent of the mill machinery at the start of that period. The losses for all New England were 1,115,120 ring spindles, 125,866 mule spindles, 28,866 twister spindles and 28,253 looms, together with 2,085 cards.

Much of this recent loss is attributed to the destructive effects of the Administration policy, but it is not forgotten that migration of equipment to other sections is due to the unwise legislative measures at home and the fatuous labor-destroying activities of heads of labor. The friends of mill workers are striving to save them from their own folly—from following unsound counsel by union heads, who suffer no hardship if they bring destruction to plants. Blind legislation, taxation and labor agitation, however, remain discouraging forces.

COMMENT ON THE COTTON MARKET

New Orleans, August 16, 1935.

DURING the past month the cotton market experienced periodical wide fluctuations. Production of American cotton last season was small, as was consumption, but the latter was larger than the former, leaving the world's carry-over of American at the close of the season less than the surplus of season before last, which, however, remained comparatively large, with much of same in control of the government.

This year there is the prospect of a larger American crop, indications, as of August 1, pointing to a production of 11,798,000 bales versus 9,636,000 bales last year, whereas the world's consumption of American last season was 11,325,000 bales against 13,537,000 season before last.

Statistics of American, including the prospective crop, are rather bearish, but there was recovery from the temporary depressions in the market owing to the possibility of the government placing a loan value on this year's crop, perhaps 12 cents per pound, as was the case last year. However, owing to the present uncertainty as to what the government will do in this respect, contract values, compared with one month ago, are somewhat lower.

CENSUS REPORT

United States— Bales— Season—	1934-35	1933-34
Consumption of lint during July in Cotton Growing States	322,909	290,010
In New England States	53 527	60,287
In All Other States	15,335	9.654
In the United States	391,771	359,951
Consumption of lint, 12 months, in Cotton Growing States	4,304,131	4,550,037
In New England States	818,583	985,398
In All Other States	237,124	164,818
In the United States	5,359,838	5,700 253
Mill stocks, July 31st	789,373	1,227,688
Stocks in public storage & warehouses, July 31st	5,739,197	5,566,007
Stocks in mills, public storage & warehouses, July 31st	6,528,570	6,793 695
Stocks in mills, public storage & warehouses, June 30th	6,960,581	7,311,028
Active spindles during July	22,312,384	24,417,778
Active spindles during June	22,709,200	24,621,334

AMERICAN COTTON

Bales— Season—	1934-35	1933-34
Came into sight (marketed)	9,619,000	13,376,000
Exports from the United States, including Canada	5,038,000	7,829,000
Spinners takings, world	11,413,000	14,442,000
World's carry-over, July 31st, including linters	9,004,000	10,921,000

WORLD'S VISIBLE SUPPLY OF COTTON, AUGUST 16TH

Bales—	This year	Last year
American	3 360,000	5,373,000
Other kinds	1,447,000	2,136,000
All kinds	4,807,000	7,509,000

A larger foreign acreage and perhaps larger foreign crops are anticipated this year. Nevertheless, other sustaining features, aside of the possibility of a 12 cent loan, is the larger consumption of foreign cotton last season, esti-

"Theoretically they were saving a lot of money on their rolls; but they never had any proof of this. Our figures now show the economy of our calf—not to mention the superior work all around."

all because they're using

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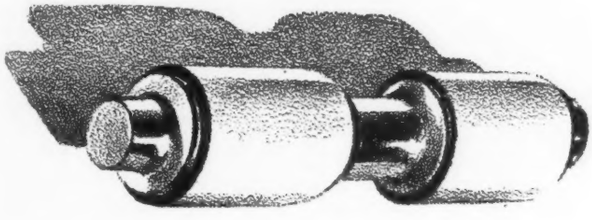

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BOSTON, MASS. PEABODY, MASS. GREENVILLE, S. C.

Fabric *Quality* begins with the *Yarn*

mated at 14,150,000 bales versus 11,792,000 season before last, and the smallness of the world's carry-over of foreign cotton this year, about 4,401,000 bales against 5,599,000 last year. Furthermore, of this year's carry-over of American, it is reported that approximately 5,000,000 bales are held by the government, which will not be available to purchasers except at a price in excess of 13 cents a pound. In other words this cotton will not come in competition with the new crop unless prices reach that level.

Progress of the Growing Crop

Substance of Washington's summary for week ended August 14th—"The weather was abnormally warm in most of the central and northern cotton belt, and rainfall was mostly light, except in the east and locally in central sections. Rain is now needed over much of the central and northwestern portions of the belt. In other parts conditions continue rather satisfactory."

Trade Outlook, at Home and Abroad

Barring possible foreign political developments, the general business outlook throughout the world, especially in the United States, appears to be brighter than at this time last year. In the United States larger crops of grain and cotton are looked for, there is more activity in the major heavy industries, particularly in steel, buyers are numerous in the Northern markets, stocks of raw cotton in domestic mills are comparatively light, and with the very large distribution of funds by the government for work relief purposes, there should be a marked improvement in general business in America during the fall, winter and throughout 1936. Week-end press advices are to effect that it is in the wholesale branches that activity was most pronounced the past week, as buyers hastened to replenish depleted inventories on a rising market, releasing long postponed orders as delivery delays grew imminent.

Exports of American Cotton Likely to Increase

During the past three seasons the world's consumption of American cotton shrunk 3,099,000 bales, declining from 14,424,000 to 11,325,000 bales. During the same period the world's consumption of foreign cotton increased 3,803,000 bales, jumping from 10,347,000 to 14,150,000. This year the world's carry-over of foreign cotton is 1,198,000 bales smaller than last year's, and is less than the ten year average. It is possible, if not probable, that, especially if foreign cotton crops should be smaller than expected, to witness a revival, so long absent, in exports of the American product, which would be of much benefit to general business, particularly on this side of the Atlantic and Pacific. Larger exports of American would indicate that consumption of American is on the increase again. Whatever be the outcome, the present situation looks promising in this respect, which is encouraging.

TOTAL AVERAGE RAINFALL IN TEXAS, IN INCHES

Year—	1935	1934	1933	1932	Normal
For July	2.33	1.99	4.21	2.42	2.60
Nov. to July, inclusive	28.74	19.61	20.57	26.38	22.87

What the Southern Mills Are Doing

The High Shoals plant of Manville-Jenckes Corp., at High Shoals, N. C., which has been acquired by Alfred Moore, president of Jackson Mills, and associates, is to be known as Jackson Mills No. 3. C. L. Chandler is general superintendent, with headquarters at Wellford, S. C. The mill has about 900 looms and 37,000 spindles, and it is reported that 3,000 additional spindles may be added to balance the equipment. The mill is undergoing a complete overhauling, preparatory to early resumption of operations.

Dover Mills Company, Shelby, N. C., have purchased an H. W. rayon conditioner from the Industrial Dryer Corporation, Stamford, Conn.

Dixie Throwing Company, Greensboro, N. C., has awarded contract for the construction of a one-story addition. The mill, which converts yarns for hosiery, will install approximately $45,000 worth of additional equipment.

The Grabur Silk Mills, Inc., Burlington, N. C., have recently completed the installation of a second unit of Fletcher throwing equipment. This machinery was bought through The W. A. Kennedy Co., Charlotte, N. C.

Merger of the Southern Bleachery and the Piedmont Print Works, Taylors, near Greenville, S. C., has been authorized by stockholders and will take effect January 1, 1936. The new company will be known as the Southern Bleachery and Print Works, Inc.

Sherman Manufacturing Co., Sherman, Texas, recently installed 78 used automatic looms. Other modern equipment has also been installed.

Borne Scrymser Company, 17 Battery Place, New York City, manufacturers of the Breton Minerol process of applying Minerol for conditioning cotton, have announced the following: The Ruby Cotton Mills, fine yarn spinners, Gastonia, N. C., have revamped their method of applying Minerol with the Borne Scrymser Company's improved single head system. The Mauney Cotton Mills, Kings Mountain, N. C., have installed the company's equipment for conditioning cotton; a two-head series of criss-cross spraying device is used to correspond to the mill's new opening system. The Erwin Cotton Mills Company Plant No. 3, Cooleemee, N. C., have equipped their mill with the process for conditioning dyed cotton, as have the Salisbury Cotton Mills, Salisbury, N. C. The Bibb Manufacturing Company has placed order with Borne Scrymser Co. for their improved equipment for treating cotton.

It is rumored that the Berkshire Knitting Mills, Reading, Pa., are considering the establishment of a branch plant in the South, with the Reading mill to continue in operation.

C. & S. Hosiery Mills, Liberty, N. C., has begun operations, producing 200 and 220-needle fancy half-hose, with a capacity of about 1,200 dozen pairs weekly.

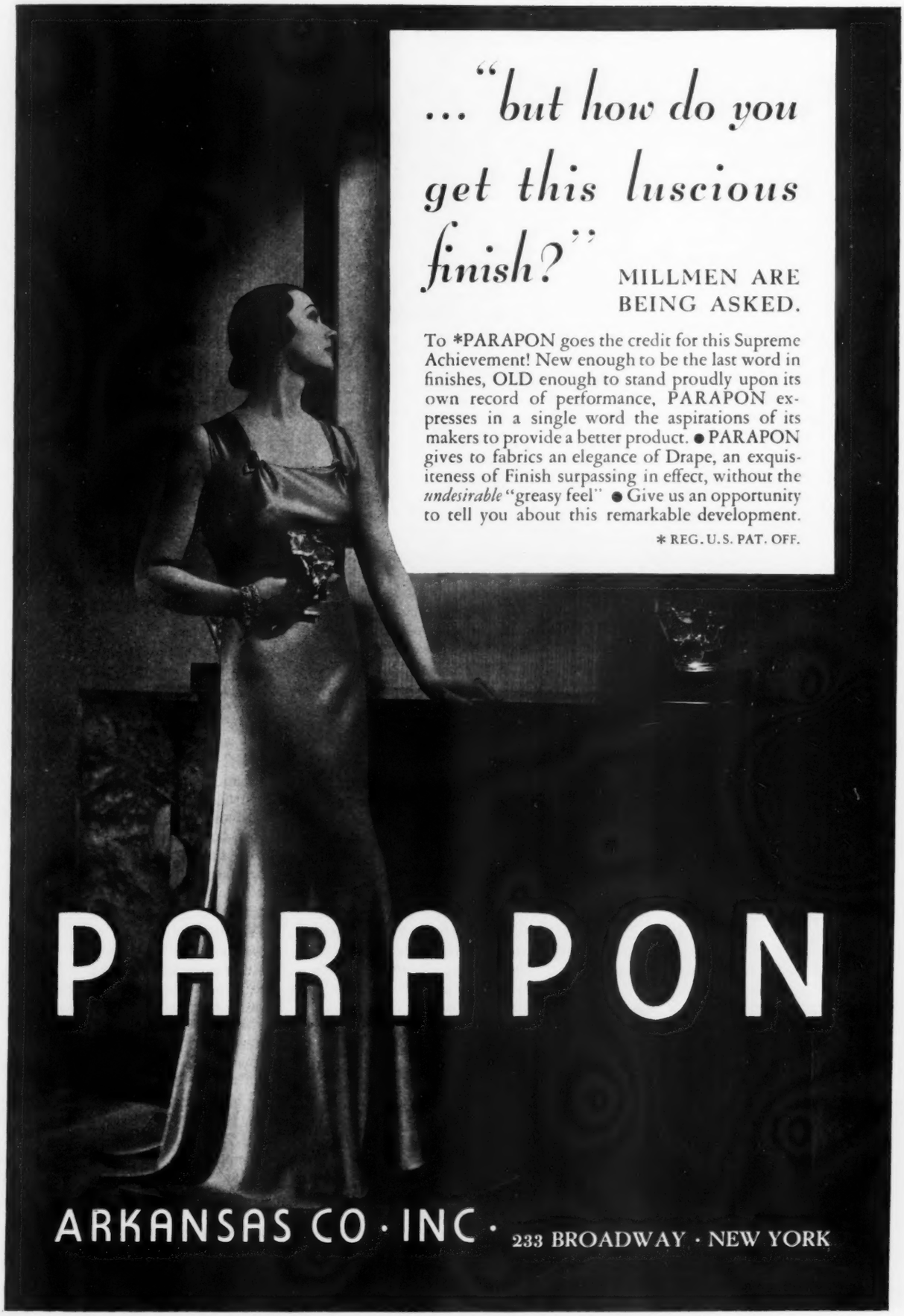
It is understood that the Pauline Hosiery Mills, Valdese, N. C., will soon install 20 new Banner wrap hosiery machines.

A new hosiery plant, known as the W. H. Snider Hosiery Mills, has been opened at High Point, N. C. It is understood that the work of the new mill will be largely confined to finishing operations at present.

The Carolina Narrow Fabric Co., Winston-Salem, N. C., has added a bleaching and dyeing department to the mill. Machinery has been installed and production has been started.

May Hosiery Mills, Nashville, Tenn., will construct a one-story brick addition, 60x150 feet, to cost approximately $7,500. It will be large enough to accommodate 150 additional machines and it is expected that production will be increased 30 per cent.

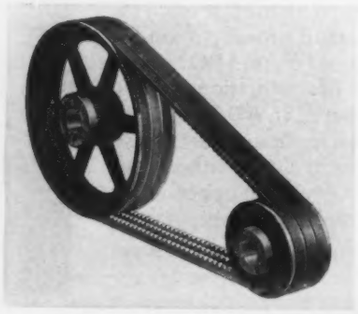
A. A. Shuford, Jr., and associates, Hickory, N. C., have acquired the plant of the Waldensian Weavers, at Valdese, N. C., and will, it is reported, put it in operation.


...“but how do you get this luscious finish?”
MILLMEN ARE BEING ASKED.
To *PARAPON goes the credit for this Supreme Achievement! New enough to be the last word in finishes, OLD enough to stand proudly upon its own record of performance, PARAPON expresses in a single word the aspirations of its makers to provide a better product. ● PARAPON gives to fabrics an elegance of Drape, an exquisiteness of Finish surpassing in effect, without the *undesirable* “greasy feel” ● Give us an opportunity to tell you about this remarkable development.
* REG. U.S. PAT. OFF.
PARAPON
ARKANSAS CO · INC · 233 BROADWAY · NEW YORK

NEW TEXTILE EQUIPMENT AND PUBLICATIONS . . .

New Cast-Machined Day-Steel Pulleys

The Dayton Rubber Manufacturing Company, Dayton, Ohio, have announced a complete new line of Day-Steel pulleys of cast-machined (semi-steel) construction, for use with the Dayton cog-belt drive for ratings up to 15-hp. The new pulleys are so formed as to be of maximum strength with elimination of all excess metal, it is



Cast-machined pulley

explained, thereby providing cast-machined pulleys of approximately the same weight as the pressed steel pulley. All finished surfaces are machined to accurate limits of precision work, the special semi-steel providing an exceptionally smooth and close-grained groove surface, the manufacturers explain; all pulleys are accurately balanced. In addition, the company will continue to offer Day-Steel pulleys of the pressed steel type with the same diameters as the cast-machined type.

Catalog on Wire Nails and Wire Products

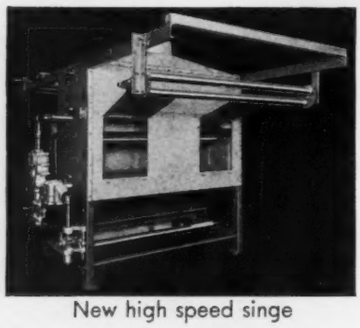
Republic Steel Corporation, Massillon, Ohio, have prepared and are distributing a new catalog on Republic Wire Nails and Wire Products. The book contains 40 pages of up-to-date information on the company's wire, wire nails and fence posts, and is profusely illustrated.

Binks Offers New Spray Painting Book

A revised 16-page loose-leaf catalog on spray painting equipment and accessories has been announced by Binks Manufacturing Company, 3114 Carroll Ave., Chicago, Ill., makers of the Thor line of spray guns and spray finishing systems. Spray guns, spray booths, syphon cups, pressure tanks, air and material hose, oil and water extractors, air compressors, exhaust fans and other necessary equipment for industrial spray finishing are listed. Also listed are complete portable spray painting outfits from the small general utility ¼-hp. size to the large 4-hp. two-man outfits.

Butterworth Announces New High Speed Singe

H. W. Butterworth & Sons Company, York & Cedar Streets, Philadelphia, Pa., have developed a new 2-flame high speed singeing machine with burners 60 inches wide, for goods 48 inches wide, arranged with stop-offs for 48 inches. It has a speed up to 300 yards a minute. The machine is equipped to singe one side with two burners, or two sides, one burner each. It is equipped with the latest type Kemp burners, and with a 3-inch control



New high speed singe

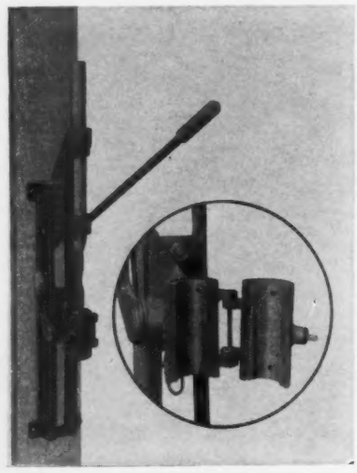
valve. It has a wet-out box and sparking rolls, and delivery reel in back. The hood is galvanized iron covering in the front end for getting at the burners. The top of the hood is arranged for a round flue which can be taken out through the roof. The machine is equipped with overhead tension frame, swing tension bars, suitable to feed goods down onto the singe, and is driven by belt direct from a motor.

Special Heddle for Weaving Tinsel

Steel Heddle Manufacturing Co., 2100 West Allegheny Ave., Philadelphia, Pa., with localized factories at Greenville, S. C., and Montreal, Canada, have developed a special heddle for the scientific weaving of tinsel dress goods. The physical characteristic of tinsel thread, it is explained, is so different from other fabrics, due to being metal, and causes a great deal more wear on the eye of the heddle. The friction created in the weaving process is much greater than that with the softer vegetable or synthetic yarn. Thus, it was necessary to develop a heddle eye to permit the metal thread, usually flat in design, to pass with a minimum of obstruction.

New Tail Stock Attachment for Cork Cot Assembling Machine

Armstrong Cork Products Company, Lancaster, Pa., have announced the development of a new tail stock attachment for the Armstrong cork cot assembling machine, designed to eliminate any lengthwise compression of



Cork cot tail stock attachment

the cot during assembly. This device grips the cot firmly on its outside diameter over its entire length, holding it so as the roll is inserted. A positioning stop is provided for quick use, to speed up the operation with accurate positioning of the cot on the roll. By supporting the cot, it is pointed out, the device eliminates tearing or splitting as sometimes encountered with extremely tight cots. This new device is being placed on all Armstrong cork cot assembling machines.

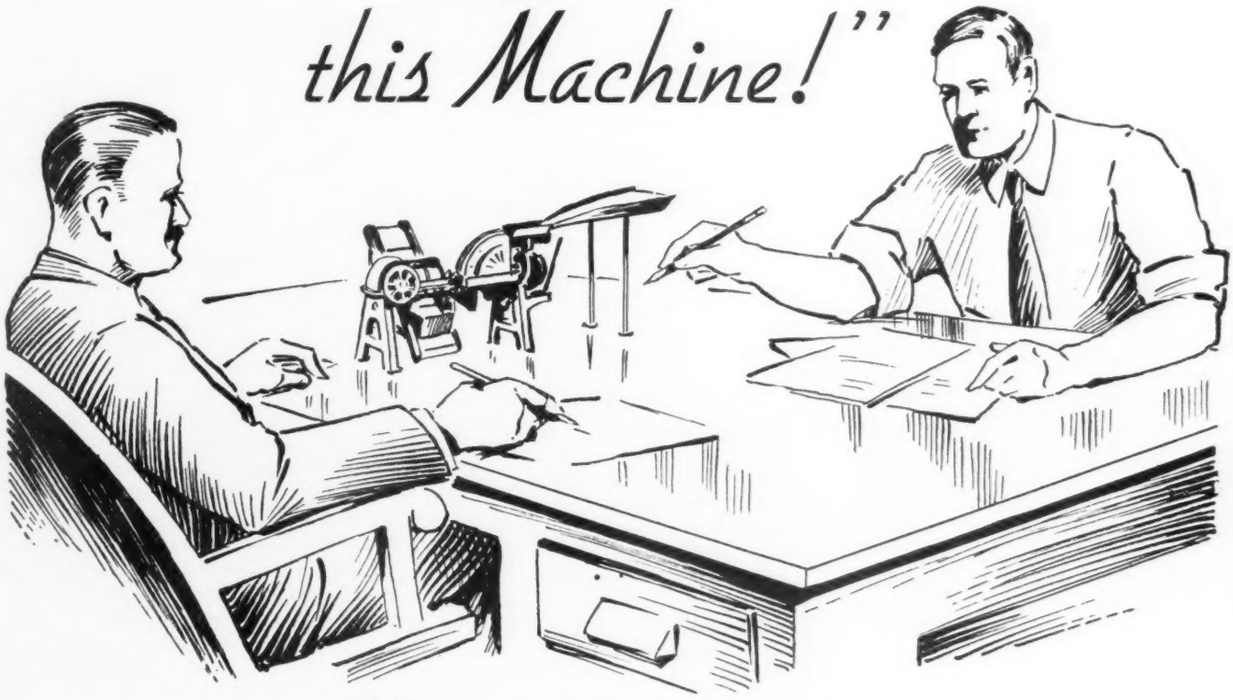
"A Word about Fence"

Cyclone Fence Company, Waukegan, Ill., have prepared an attractive 24-page booklet discussing the subject of fence, how to use it and how to choose it. Comments on the different types of fences suitable for different applications, and excellent illustrations, make up the booklet.

Alemite Hand Guns and Fittings Catalog

Alemite Corporation, Chicago, Ill., now has ready for distribution its most modern lubrication equipment manual, the latest Hand Guns and Fittings Catalog. There are 54 pages, with a tab index for each type of Alemite fitting, gun and hose, and for the various accessories of the several Ale-

"We Can't Afford to Be Without this Machine!"



MR. EDWIN D. FOWLE, Associate Editor of *Textile World*, states that a mill cannot afford to be without a machine that will return its investment in three years.

That is why so many Type K Bobbin Strippers are replacing obsolete machines and methods.

The following is typical of reports that we are receiving regularly from our salesmen:

> *"This mill has been using four men on the day shift and three on the night shift, cleaning quills by hand. We will be able to do the job with one man on each shift, thus making a saving of five men or $60.00 a week."*

The Type K machine has a speed of from 100 to 120 bobbins a minute. It is the most efficient system ever devised for cleaning bobbins. Typical of its reception, we quote another paragraph from a recent sales report:

> *"The operator said he could finish from an hour to an hour and a half before stopping time each day, which was a little better than they had been able to do with the Double-end machine they are discarding, when using two operators. He said the same applied to the night shift. He also added that his job is now easier, even though he is doing all the work himself, because the machine is so much easier to feed."*

Can you afford to neglect the installation of such a valuable machine in your mill?

Let our representative call and give you an estimate of the savings which Type K machines will make for you

the new TYPE K Bobbin Stripper

The Terrell Machine Company, Inc.

1200 North Church Street CHARLOTTE, NORTH CAROLINA

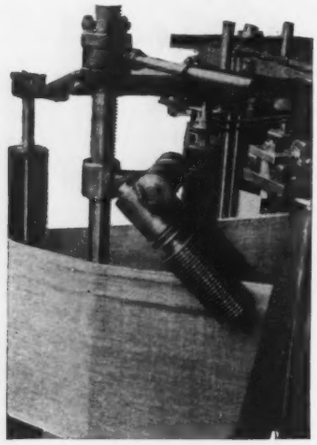
MR. LUTHER PILLING, Danielson, Connecticut, *Representative for N. Y., N. J., Pa., New England States, and Canada*

GEO. THOMAS & CO., LTD., Manchester, England, *European Agents*

mite systems. The catalog is fully illustrated, with many blue-print drawings.

New Loop Clipper

Hermas Machine Company, Hawthorne, N. J., have developed a new loop clipping device, for removing loops from goods automatically, to permit the automatic removal of loops from low end goods economically and efficiently.

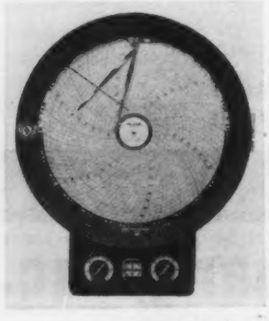


New loop clipper

It is explained that in the past it has been the custom to remove loops from certain types of fabrics by hand, and in some lines, as in the cheaper grades of linings, the loops were left on because it was too expensive to remove them. The new development is designed for such use. It is extra equipment on new machines, and may also be applied to any existing Hermas shear; it automatically clips all loops so they may be removed by the shear.

New Controllers

The Brown Instrument Company, Wayne & Roberts Ave., Philadelphia, Pa., have announced a new and complete line of recording and indicating air-operated controllers for temperature, flow, pressure and liquid level. One of these is the Brown "Air-o-line",



In new Brown line

a controller with 1 to 150 per cent throttling range and automatic re-set. Indicating and recording thermometer-type temperature controllers are included for temperatures within limits of —40 degrees to +1,200 degrees F. Two types of flow controllers and liquid level controllers are also offered: the inductance bridge type and the mechanical type. For the first time, it is explained, the remote operating characteristic of the electric flow meter and the flexibility of air-operated control are combined in one controller.

Leaflet on "Synchro-Operator"

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., have published Leaflet No. 2202 on the subject, "Synchro-Operator", which describes this device which automatically performs all the functions necessary to synchronize generators so they will operate in parallel.

Leaflet on Valves

The Lunkenheimer Company, Cincinnati, Ohio, have issued a new circular, No. 504, describing the company's line of "King-clip" gate valves. The circular illustrates and lists all types in the line—inside screw, outside screw and quick operating in both iron body bronze mounted and all-iron patterns—with large sectional illustrations of the various parts.

Description of Double Strength Steel

Republic Steel Corporation, Massillon, Ohio, have prepared reprints of an article on the subject of the company's new high tensile steel, by Howard L. Miller. It contains a great deal of authentic information on this new product which has a wide field of application where the requirement is for a high strength steel, the company explains.

1935 Edition of Official American Textile Directory

The 1935 edition of the Official American Textile Directory has been published by McGraw-Hill Publishing Co., 330 West 42nd Street, New York City. This brings up-to-date annually the listing of textile mills and other divisions of the industry. First, it lists geographically the mills of the United States and Canada, giving the name and location of the mill, names of executives, equipment, products, etc. Second, a classified yarn trade section giving spinners of cotton, woolen, worsted, rayon, silk, linen and jute yarns. Third, a classified bleaching, dyeing, printing and finishing section, listing all these plants according to process and product. Fourth, an alphabetical section, listing all mills by company or mill name. The price of the directory is $4.00 per copy.

Portable Mercury Lamps for Better Lighting

The newest use of high intensity mercury lamps is in indirect portables suitable for supplementary illumination in light-starved offices and small retail shops where the wiring for lighting is already loaded to safe limits. Experiments with this type of light source in the photometric laboratories of the Westinghouse Lamp Company indicate that such practice will not only lift the level of illumination but will improve the color quality of incandescent light.

In many offices and shops today where wiring capacity will not permit the use of adequate illumination with safety, a mercury lamp indirect portable can be plugged in a convenience outlet which is usually wired on a separate circuit from that supplying the overhead illumination. Operating at a higher efficiency than incandescent lamps, a 400-watt high intensity mercury lamp will provide illumination equivalent to a 750-watt Mazda lamp.

In a typical office bay with a twelve foot ceiling and with decorations of high reflection characteristics, a 400-watt mercury lamp will add from five to ten footcandles on the desk tops. Office illumination of 15 footcandles average on the desk tops, produced by four 500-watt incandescent lamps in semi-indirect fixtures, showed an increase of six footcandles when the 400-watt mercury portable was placed in the center of the room with a twelve-foot ceiling. Added illumination of this amount is often enough to remove any conditions of uncertain vision existing where inadequate lighting levels prevail.

Besides raising lighting levels, the use of a mercury portable will improve the color quality of artificial illumination. The bluish-white light of the mercury lamp compensates for the lack of blues in the yellowish-red incandescent light. The combined illumination approaches the color of daylight and gives a more natural working light in those offices where accountants and clerks must keep their eyes glued to ledgers all day long.

The special indirect portable used in the Westinghouse experiments was built by the Mutual-Sunset Lamp Company. It stands 70 inches high and has a special transformer concealed in the base. The reflector has an opening of 20 inches and is mat-finished to diffuse the light of the clear bulb mercury lamp and thereby minimize ceiling figurations. The reflector is designed with a special contour which utilizes to high efficiency the elongated light source of the mercury lamp.

What do others say about ARCY—the quick, safe, uniform and dependable starch liquefying amylase?

Here's one of the many comments received from mill superintendents.

**** "We find a very noticeable increase in the amount of added weight taken on by the warp yarns, due to the increased penetration of the size into the yarn.

"Then again, we do not have the trouble of circulating pipes becoming stopped up, because the size solution is practically a non-congealing solution, and prevents formation of lumps or caking in the cooking kettles, hence we find it very free from lumps.

"Excessive humidity, I find, is not needed in the weave room for properly conditioning the warps for best weaving conditions. I find no trouble in changing from one car of pearl starch to another, or from one brand of pearl starch to another brand, since the enzyme liquefies pearl starch made by all the different starch manufacturers equally well.****"

ARCY 4-X is used for liquefying thick-boiling CORN and SAGO Starches. ARCY 1-X is used for liquefying POTATO and TAPIOCA Starches.

Full information gladly furnished on request to DRAKE CORPORATION, NORFOLK, VA.

ARCY

TIMELY NEWS ITEMS WITH A TEXTILE SLANT . . . .

Thermoid Appoints Terrell as Carolina Representative

The Thermoid Rubber Co., Trenton, N. J., has appointed the Terrell Machine Co., Charlotte, N. C., as exclusive sales agents and distributors of its line of mechanical rubber goods for the textile and allied industries in North and South Carolina. The Thermoid line includes a complete range of belting, packings, tubing, hose and industrial brake and clutch linings. Thermoid hose is made for steam, water, air, suction and sand blasting in a complete range of sizes and specifications. The company's fabric and rubber belting covers the entire range of transmission belting and conveyor belts of standard or special design; the line of packing includes asbestos packings of all kinds for steam and air, general purpose packings, hydraulic, and asbestos or rubber sheet packings.

Solvay Opens Charlotte Office

Solvay Sales Corp., manufacturers of alkali and chemical products, have opened district offices in the Johnston Bldg., Charlotte, N. C., to better serve the textile industry. H. O. Pierce, who has been district manager with headquarters in Charlotte, is in charge of this office.

Ohio Valley Appoint Burton

Roy V. Burton has been appointed southern representative for The Ohio Valley Pulley Works, of Maysville, Ky., manufacturers of transmission equipment.

Manies Represents National Tool

J. Manies, manufacturers' representative, Gastonia, N. C., has been appointed southern representative for National Tool Company, Cleveland. Ohio, manufacturers of gear cutters, saws and other machine tool equipment.

New Textile Patent

According to Paul B. Eaton, patent attorney, Charlotte, N. C., Oscar D. Burton, of Kernersville, N. C., was recently granted a patent on a warp beam having a groove with a fitting to which the knotted ends of the warp are secured; the groove has means whereby the fitting is releasably held in the groove. Also, two warp ends may be secured together with the fittings.

Textile Associates Club

The annual meeting of the Textile Associates Club was held recently at the New Ocean View House, Oak Bluffs, Mass. The business meeting was opened with all members rising out of respect for its late member, John Fernley, who had held office for 35 years. Following the reading by the secretary of the activities of the Club for the past season and other unfinished business, the following officers were unanimously elected: Henry J. Viens, president; Alfred Pate, vice-president; Ernest Whitworth, secretary-treasurer; John Dawson, assistant secretary; and George Hutchinson, auditor. Robert W. Boys, who had been president for 25 years, declined re-election as his present residence in the South would prevent his taking an active part in the club's affairs.

Westinghouse Air Conditioning Transferred to Merchandising Division

The transfer of the air conditioning department from East Pittsburgh, Pa., to Mansfield, Ohio, where it becomes a part of the merchandising division, is announced by A. E. Allen, vice president in charge of the Westinghouse Electric & Manufacturing Company's merchandising operations. This transfer affects all sales, engineering and manufacturing activities of the air conditioning department.

The purpose of this change, according to the Westinghouse merchandising executive, is to effect a closer coordination, particularly in the design and manufacture of air conditioning equipment with the other closely allied products now within the scope of the merchandising division.

Announcing the transfer, Mr. Allen stated that the company's air conditioning program will be enlarged and expanded, and predicts that this business will be of great importance to the future activity of the merchandising division. Westinghouse will continue to distribute its air conditioning products through its present dealer channels, he continued.

The engineering and manufacturing of air conditioning products will be centered at the East Springfield, Mass., plant of the Westinghouse company. The sales headquarters will be located at the Mansfield plant, the headquarters of the merchandising division.

Obituary

CLARENCE B. SEAL, southern representative of the Philadelphia Felt Company, passed away suddenly at his home in Washington, D. C., on August 15. Mr. Seal, previous to his connection with the Philadelphia concern, had been for a number of years director of The A. French Textile School of the Georgia School of Technology, Atlanta, Ga. He was widely known among the southern textile mills. Funeral services were held in Washington on August 16, with burial in Westchester, Pa., on August 17. He is survived by Mrs. Seal and one daughter, MISS ELEANOR SEAL.

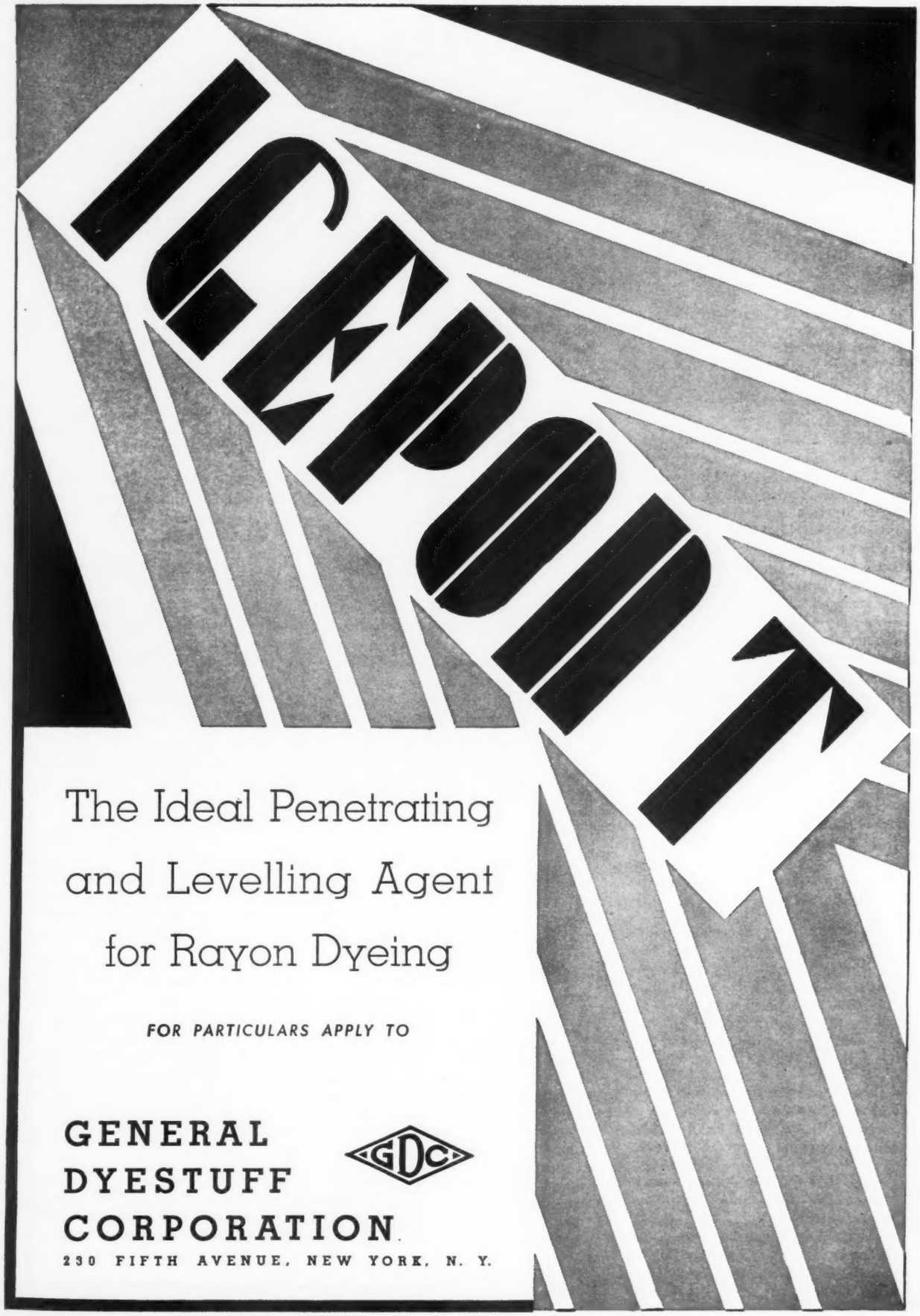
HENRY P. HUNTER, of Anderson, S. C., died recently after an extended illness. He had been superintendent of the Equinox and Gluck Mills, of Anderson, until ill health forced his retirement several years ago.

CHARLES F. BURNEY passed away in Dallas, Texas, on August 10. He was a graduate of the Georgia School of Technology, in Atlanta, in textile engineering, and had been prominently connected with the textile industry. At the time of his death he was president of the Minatex Company of Dallas, and of the recently organized Texas Woolen Mills Company. He was a native of Monticello, Ga., where funeral and burial services were held on August 13.

GRANT SIPP, president of the Sipp-Eastwood Corp., Paterson, N. J., died at the Charlotte Hungerford Hospital in Torrington, Conn., on July 28. He had been moved to the hospital a week previously when he suffered a heart attack while motoring through New England. He was 68 years of age, and founded the Sipp Machine Co. 40 years ago. Shortly after the merging of his company with the Benjamin Eastwood Co. in 1929, Mr. Sipp became president of the new company.

D. D. LITTLE, president and treasurer, Florence Mills, Forest City, N. C., and American Spinning Co., Greenville, S. C., and treasurer of the Appleton Company, Anderson, S. C., passed away on August 15 at his home in Spartanburg, at 77 years of age. He is survived by Mrs. Little, and two sons, HUGH F. LITTLE and D. D. LITTLE, JR., of Forest City, N. C.

R. P. SNELLING, vice-president of Saco-Lowell Shops, died on August 15 at 74 years of age. He was active head of that company until 1923, when he resigned as treasurer, having been active in the textile industry for more than 50 years.


ICEPONT
The Ideal Penetrating
and Levelling Agent
for Rayon Dyeing
FOR PARTICULARS APPLY TO
GENERAL
DYESTUFF
CORPORATION
GDC
230 FIFTH AVENUE, NEW YORK, N. Y.

PERSONAL NOTES

about Men You Know

FRANK E. ROWE, JR., who for the past three years has represented the Saco-Lowell Shops in the southern states, as sales engineer with headquarters in Atlanta, has returned to the company's shops in Biddeford, Maine. Mr. Rowe has been associated with the textile industry since leaving Lowell Textile Institute in 1912. He went directly to a mill and over a period of seven years worked up through the usual practical jobs in the carding and spinning departments to the position of superintendent. Following this, he was in charge of textile engineering for W. R. Grace and Company, severing this connection in 1920 to join the Saco-Lowell organization. While in the South, Mr. Rowe has devoted his time to assisting his firm's customers in applying their equipment to the best advantage. It is understood that in his new position he will be intimately associated with the company's research engineering. He expects to continue occasional personal contacts with the southern mills.

Frank Rowe, Jr.

CARL M. MOORE, who recently resigned as superintendent of the Piedmont Manufacturing Co., Piedmont, S. C., has become connected with the personnel department of Callaway Mills, LaGrange, Ga.

W. E. (BILL) OUTEN has joined the sales force of Matthews Morse Sales Co., Charlotte, N. C., and will cover the North and South Carolina territory. This firm is southern sales agents for Quaker City Rubber Co., Morse Chain Co., and other manufacturers of mill specialties.

ODIS E. STEVENS has resigned as general manager of the two plants of Saratoga Victory Mills, at Albertville and Guntersville, Ala.

J. W. O'NEAL has become superintendent of the Gainesville Cotton Mills, Gainesville, Ga. Mr. O'Neal, a native of West Point, Ga., who attended Emory University and the Philadelphia Textile School, has been assistant superintendent of the Consolidated Textile Corporation plant at Lynchburg, Va. At Gainesville he succeeds GEORGE B. MOORE.

BEN P. GREENE, formerly superintendent of the Standard-Coosa-Thatcher Company's spinning plant at Chattanooga, Tenn., has become general superintendent of the spinning mills of the American Yarn & Processing Company, Mount Holly, N. C.

BRADLEY S. ASKEW has resigned as overseer of carding and spinning at The Athens Manufacturing Co., Athens, Ga., and has become overseer of carding at Macon Textiles, Inc., Macon, Ga.

CHARLES GELSON, formerly connected with the Colrain plant of the Kendall Mills, has been promoted to the position of assistant manager of the New Bedford plant of the same company.

PAUL SEYDEL, president and chief chemist of Seydel-Woolley Company, Atlanta, Ga., spent August on a western trip, which included attendance at the meeting of the American Chemical Society in San Francisco, where he represented the state of Georgia as councillor. He was accompanied by Mrs. Seydel (MILDRED SEYDEL), well known newspaper woman for the Hearst organization, who visited her many acquaintances in Los Angeles and Hollywood.

T. F. CUDDY has been transferred from superintendent of the Nims and Woodlawn Mills of American Yarn & Processing Co., to the Adrian and Madora Mills of the company, Mount Holly, N. C., where he succeeds N. P. BUMGARDNER.

E. GRAY BOST has been made treasurer of Cannon Mills Co., Kannapolis, N. C., succeeding G. B. LEWIS, who has resigned on account of ill health. Mr Bost has been assistant secretary. HEARN SWINK, secretary, has been elected to succeed Mr. Lewis on the board of directors.

TOM TARWATER has been made president of the Rockwood Mills, Rockwood, Tenn., and of the Harriman Hosiery Mills, Harriman, Tenn., succeeding his brother, the late POLK TARWATER.

D. A. JEWELL, JR., has been elected president of Crystal Springs Bleachery, Chickamauga, Ga., succeeding his father, the late D. A. JEWELL, SR. R. H. JEWELL, formerly treasurer, has been made vice-president, and C. CALLAWAY, assistant treasurer, has been promoted to treasurer.

ROBERT A. WHATLEY recently resigned as superintendent of Carl Stohn, Inc., Charlotte, N. C.

BEN MORTON recently resigned as overseer of carding at the High Point Yarn Mills, High Point, N. C.

F. D. HERRING has become overseer of weaving at the Avondale plant of Cliffside Mills, Avondale, N. C., succeeding J. L. BEARD, who is now superintendent of weaving at the Riverside division of Riverside & Dan River Cotton Mills, Danville, Va.

J. V. WESTMORELAND has resigned as overseer of cloth room at the Rushton Cotton Mills, Griffin, Ga.

W. D. KNOX has been made overseer of weaving at the Mathews Cotton Mills, Greenwood, S. C. He formerly was night overseer.

W. A. (WES) HUNT was promoted to the position of superintendent at the Meritas Mills, Columbus, Ga., in August. He had been overseer of carding and assistant superintendent. As superintendent, he succeeds W. A. PRINCE. W. L. HUDSON was promoted to assistant superintendent. C. A. BUTTERWORTH is local manager at this plant.

S. R. POWER has resigned as superintendent of Chadwick-Hoskins Mill No. 5, Pineville, N. C., to become superintendent of Jackson Mill No. 3, formerly Manville-Jenckes' High Shoals plant, High Shoals, N. C. His duties at Pineville have been added to the position of J. C. TEPTON, who is also superintendent of the Chadwick-Hoskins plant No. 4 at Charlotte.

JOHN R. FEDERLINE, JR., formerly overseer of spinning at the Lanett Mill, West Point Mfg. Co., Lanett, Ala., and more recently superintendent of the Clearwater Mill, Clearwater, S. C., has become overseer of spinning at the Beaumont Manufacturing Co., Spartanburg, S. C. J. I. LAURENS, formerly overseer of weaving at Aiken Mills, Bath, S. C., is now overseer of weaving at Beaumont.

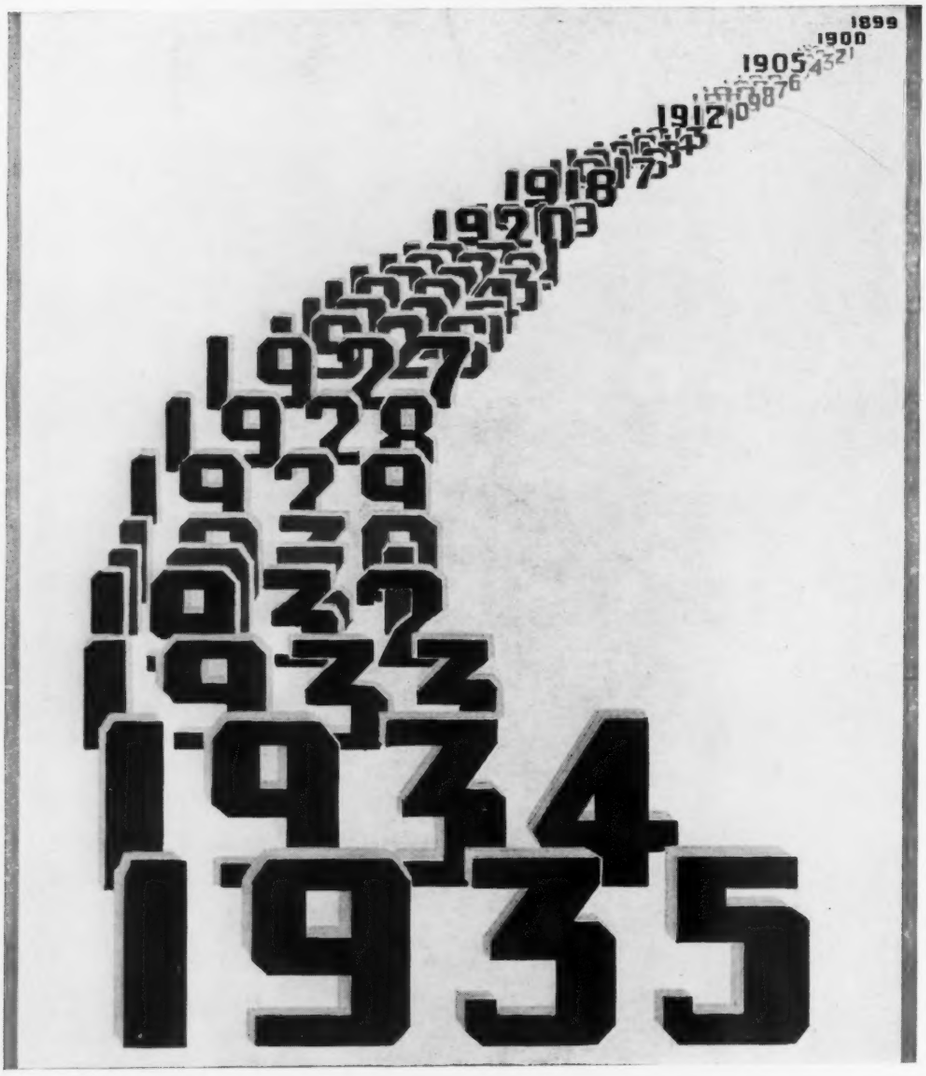
J. S. NEELY has become superintendent of the Modena mill of American Yarn and Processing Co., Mt. Holly, N. C. He was formerly with Standard-Coosa-Thatcher Co., Chattanooga, Tenn.

(Obituary Items on page 82)

A *Recent* survey of southern mills shows about 214,000 looms supplied with warps handled through improved spooling or winding systems . . .

Of this Total . . . 160,000 looms, . . or 74.8 per cent are using warps from

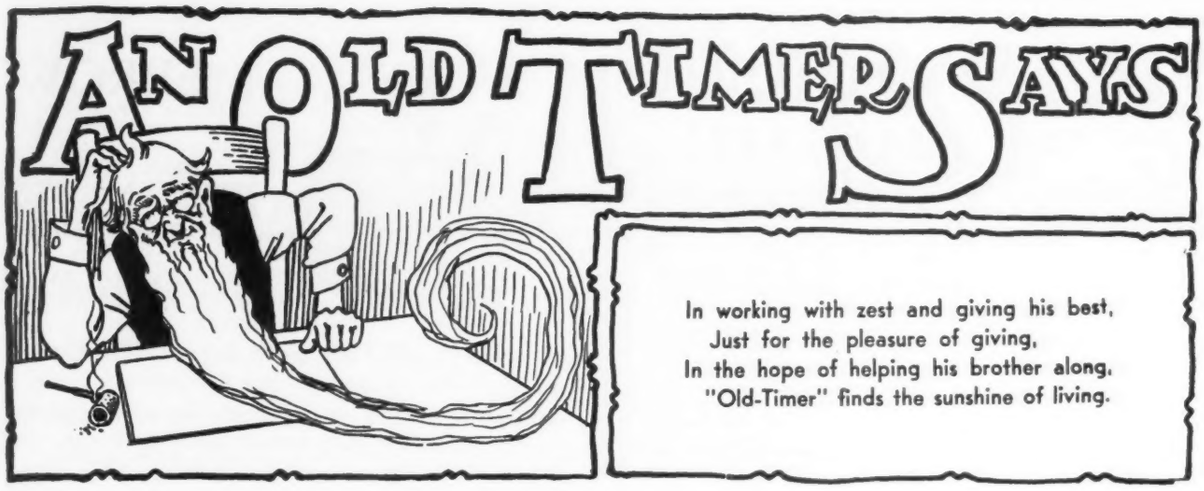
Barber-Colman Spoolers and Warpers



HIGH SPOT YEARS....

. . . as SONOCO figures them—years when we have completed and perfected a major improvement or devised a superior product—which, in turn, has effected greater economies and new efficiencies in the Textile Industry we serve.

Since 1900 these years have cropped up in our history, increasing in frequency as the background of our experience has grown, and the results of our constant technical research and experimenting culminates in definite achievements.


AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brother along,
"Old-Timer" finds the sunshine of living.

There Are More Good Jobs Than There Are Good Men

You've heard that old axiom about the "law of supply and demand".

In other words, the law of supply is supposed to supply the demand, and that may be true with most commodities such as corn, cotton, wheat, potatoes, etc.

It may also be true in regard to stocks, bonds and other investments, but there is just one thing that OLD-TIMER has never seen "supply the demand" and that is "men". No, not just the ordinary kind of man —the supply is over-running the demand for that kind —but men who can *manage* other people's businesses— men whom employers can put utmost confidence in— men who make an intensive study of their work— men whom employers would gladly pay $10,000.00 and $20,000.00 per year for if they could only find them. If you $5,000.00 men who read this, don't believe it, I can furnish the proof.

* * *

The average salaried man does not realize how difficult it is for large employers to find men for the positions they have in mind. True, most of those positions are filled, but the employer is keeping Smith, not because Smith's work is entirely satisfactory, but because he cannot find anyone who will do better than Smith. He would be only too glad to pay more for the position than he is paying Smith if he could only find the man who would fill the position better than Smith.

Gosh, fellows! why don't you put your heart into your work? Promotion is standing waiting with outstretched arms, begging you to take that bigger job. The reason you haven't got it is because you are not trying hard enough.

* * *

When your boss puts a new responsibility on you that is just another opportunity for you to rise one more notch in his estimation by making a better job of it than he was expecting you to.

* * *

It is not usually the high priced men who run up the "overhead" cost in an organization, but the low priced men who in the long run are the most expensive.

* * *

When you think an unkind thing about someone just "think" it; don't ever say it.

* * *

The desire to excel, to beat the other fellow, will grow like a mushroom if you will give it a start by really doing a few things better than the other fellow and seeing how much satisfaction you derive from it. Incidentally, you will not have to tell the boss about it. He will know it all right.

* * *

Goodness! if we could only get employees to take as good care of the firm's machinery as they do of their automobiles it would be wonderful.

* * *

Strange, but true; your failures do not pile up on you as long as you keep trying to improve; they seem to fade away.

* * *

Something to ponder over:

The final stage of improvement is NEVER reached in any machine, in any business, nor in *Any Individual.*

Why not wake up, brother?

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When you are confronted with a hard problem, something about your work that you just don't see how you can accomplish, stop and think. Everything looks hard at first. Can you skate or ride a bicycle? Remember when you were trying to learn? Doggone, wasn't it hard, and can you remember when teacher told you that you must have that multiplication by heart next day or else—darn, wasn't that eleven one hard? Yeah, partner, everything looks hard at first!

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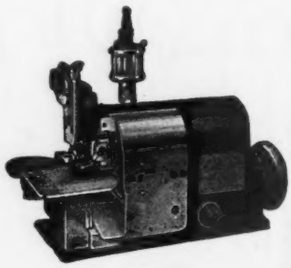

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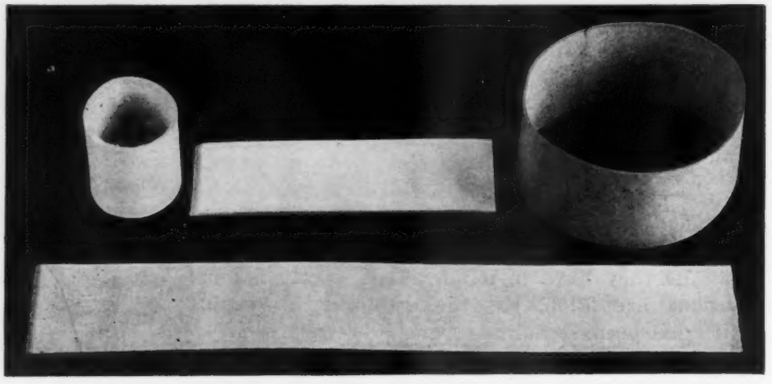

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◆ ◆

Preventing Filling Breaks on Bobbin Change

EDITOR COTTON:

In February COTTON I read the article from Mr. Moberg, relative to looms breaking the filling on the bobbin change, and I will try to offer a few suggestions in harmony with Mr. Moberg's ideas.

Mr. Moberg said, "See that the tip of the bobbin is not snapped downward on the bobbin change". Now this snapping downward of the tip end of the bobbin is, I think, the only thing that will cause the filling to break on the change proper, but it can be cut or broken before or after the change, as I shall mention later.

The thing we are interested in now is to know what causes the tip of the bobbin to snap downward, that is, to snap down lower than the ring end of the bobbin in the shuttle. When this occurs it will break the filling, as the filling being pulled at an angle from the end of the bobbin cannot unwind. If the shuttle is going up under the battery too far it will cause the ring end of the bobbin to strike too far back on the shuttle spring, and the tip end will snap down too far before the bobbin will enter the spring and become straight. The picker being worn out too deep will cause this, but if the picker is not badly worn, there is no need to discard it, as that takes time. Just insert another piece of leather in the lay end behind the picker stick.

We might also check up on the position of the lay. It might need moving back to the left just a little. Another thing that will cause this snapping downward is the transferer going too far down in the shuttle. Mr. Moberg mentioned this and suggested a play of about 1/16-inch between the transferer and the rings on the bobbin when the transfer is completed. I think we should have at least that much, and more does not harm if the rocker shaft boxes are worn a little, or if there is just a little lost motion in the crank arms, especially if running a little weave, and very high speed. However, if the rocker shaft boxes or crank arms have too much play we must get it out before we can stop your breaking filling on the change, as this extra lost motion will let the lay come too high up, or too far forward, either of which will cause the transferer to go too far down into the shuttle, snapping the tip end of the bobbin downward when changing.

Another thing to look after is a worn transferer. If the transferer is badly worn where it comes in contact with the rings on the bobbin, this will let the shoulder of the transferer that goes up past the rings, come in contact with the bobbin and tip, or snap the end of the bobbin too far down. This can be remedied by grinding the transferer down on a small emery wheel. If the bobbin is filled too full at the bottom, this shoulder on the transferer will strike the yarn and snap the bobbin down. Some readers may not think they have so much trouble with the bobbins snapping downward on the filling change. If they have never noticed it, just let them look over their looms and note that little bright place that is worn on the lay end at the front of the slot through which the picker stick passes; and see if they can find anything that can wear that little place out there, save the rings on the bobbin striking there as the shuttle is delivered after changing filling, and the bobbin snapped down so far that it does not come back into place until the rings touch at that point. This will also cause the bobbin to be thrown out of shuttle.

When checking over a loom that is breaking filling on the bobbin change, the first thing to look at is the shuttle box back plate. See if it has a little bright spot worn on it where it comes right under the thread guide. If it has, then we need look no further, for it is cutting the filling on the thread guide before the transfer takes place. It does not take but a minute to look at this and it may save an hour's work. The picker stick being a little long might cut the filling before the transferer operates, too.

If the shuttle eye is not threading properly, the filling will be broken as it comes back from the shipper side of the loom.

We may caution our weavers about the proper angle to place the filling from the small end disc to the thread guide, and to wind it around the thread holder tight enough to hold it in place. This of course may help some if a loom is not breaking the filling too often. But now just look over the job and see how many looms we have that never break the filling on the bobbin change, and see how haphazardly the filling is wound up. Then we will get onto some one besides the battery hands. If a loom is set up as it should be, we can not very easily make it break the filling on the change by the way we wind the filling on the thread holder. Well, try it and see, if you don't want to take my word for it!

JACK (TEXAS).

LAY—Is Relative Arrangement, by Fay H. Martin

THIS is the third of the current series by Mr. Martin, covering Draft, Twist, Lay and Tension. The first article, on Draft, appeared on page 79 of the July issue; the second, on Twist, was on page 79 of the August issue.

These articles explain these important elements of cotton manufacture in the clearest terms, containing facts and information out of a lifetime of experience by Mr. Martin, a recognized authority on the roving frame. The fourth and concluding article, covering Tension, will appear in an early issue. The reader is urged to preserve his copy of each installment for permanent filing and reference.—The Editor . . . . . .

THE word "Lay", when used in connection with a roving frame, means coils of a strand of roving around the outside of a bobbin and the unit of measurement is "layers per inch" lengthwise of the bobbin.

While a strand of roving is being wound one coil around the bobbin, the bolster rail must make a movement equal to the space that is occupied by this strand; this space can be called diameter of roving. Hence in calculating for a constant number for the lay, the winding and lifting gearing must be used; the train of gearing starts with the bobbin gear, through the compound thence through the spider gearing, to the gear on the lifting shaft at the rack.

The bottom cone of a roving frame governs and controls all movements of the lay and winding but the cone and its connecting gearing, letters p, o, n, and m (See Fig. 5, herewith) do not enter the calculations of the lay constant in any way.

The letters or symbols used are as follows for a 7x3½-inch frame:

l	Bobbin gear.
k	Bevel gear on bobbin shaft.
h	Bobbin shaft sprocket.
g	Yoke shaft sprocket, vertical chain.
f	Yoke shaft sprocket, horizontal chain.
e	Differential sprocket.
O	Differential sleeve gear at head end.
R	Differential regulating gear.
S	Center lift driving shaft bevel pinion.
T	Reverse stud bevel gear.
U	Reverse stud bevel pinion.
V	Center lift shaft twin bevel gear.
CH	Change gear.
W	Center lift intermediate gear.*
X	Center lift intermediate pinion.*
Y	Lifting shaft gear.
Z	Lifting shaft pinion. Drives rack.

*These are called intermediates in the list but are not used as such.

The "set up" for the constant calculation would read thus:

l =	21	—	43 = k
h =	26	—	34 = g
f =	32	—	41 = e
O =	30	—	58 = R
S =	35	—	76 = T
U =	16	—	70 = V
CH =		—	112 = W
X =	18	—	86 = Y
29 =	29	—	3 = 3
Z =	6.272		

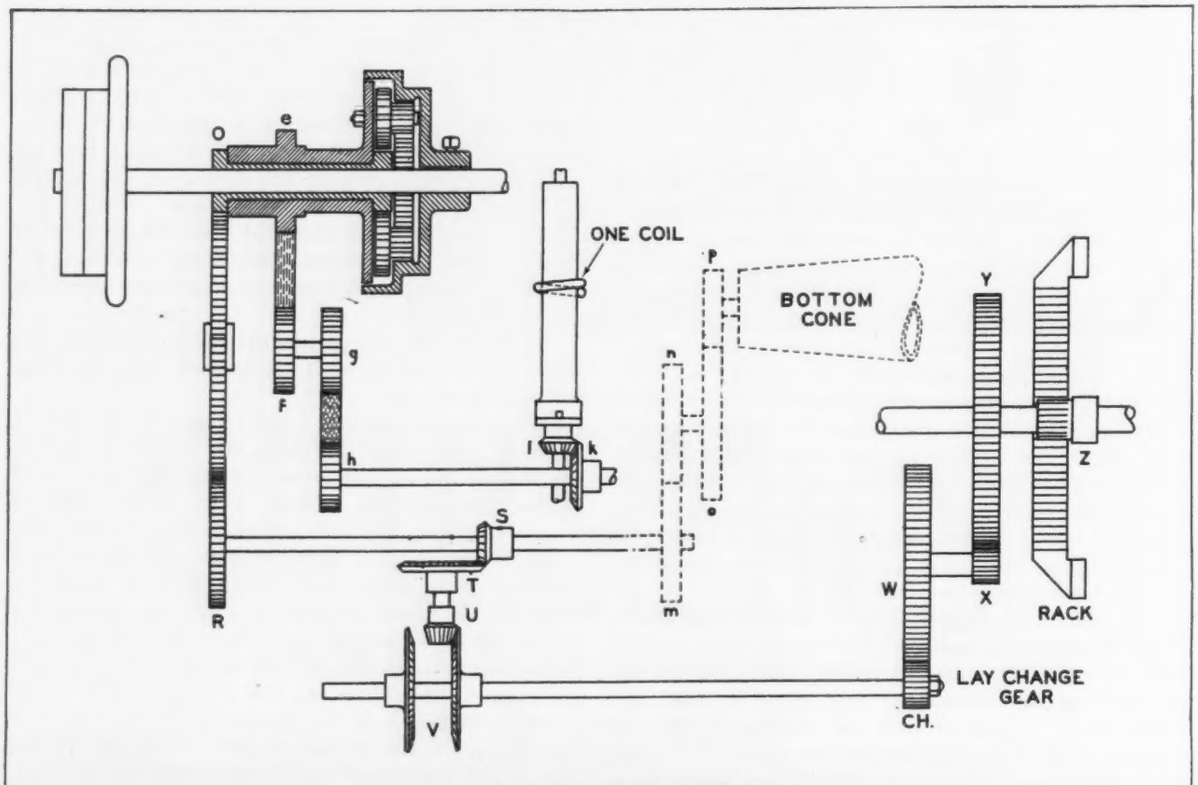

FIG. 5, LAY GEARING TRAIN DIAGRAM

In making this "set up", you start with the bobbin gear l, putting it in the left hand column, then put the next gear, which is k, in the right hand column, then alternate the gears, first left then right columns until you have reached the end of the train. The numbers 3 and 29 are the ratio through the differential or compound, whichever you want to call it, reduced to a decimal it is equal to .10345.

The number 6.272 is the distance around the pitch line of the lifting gear Z which has 16 teeth 8 pitch; the distance from the center of one tooth to the center of the next one is .392-inch, which multiplied by 16 equals, .392-inch $\times$ 16 = 6.272-inch, hence one revolution of the lifting shaft with this 16 tooth on it would carry the rack 6.272-inch.

Now turn the columns to the left and cancel. (See article on Draft, page 79, July issue)

$$\frac{43 \times 34 \times 41 \times 58 \times 76 \times 70 \times 112 \times 86 \times 3}{21 \times 26 \times 32 \times 30 \times 35 \times 16 \times - \times 18 \times 29 \times 6.272} =$$

$$\frac{24486307}{44029.44} = 556.13 \text{ Constant number}$$

This constant number divided by the change gear, say 25, gives the layers per inch.

$$\frac{556.13}{25} = 22.24$$

The foregoing is for the mechanical calculation.

It will be noted that the diameter of the bobbin is not taken into consideration, and the bobbin may be 1⅜-inch, 1 7/16-inch, or 1½-inch, which is the usual diameter for a 7-inch traverse frame. These different diameters are taken care of by an adjustment of the cone belt or even by changing the bottom cone gear (p) one tooth to obtain the right tension on the roving at the start of the empty bobbin. This adjustment does not change the relation of the lay train in any way.

As said before, the calculations so far have all been mechanical and are positive in their movements, as will be seen by a careful study of Fig. 5. Starting at the bobbin gear l. to k. to h. to g. to f. to E. to compound 3 — 29. to O. to R. to S. to T. to U. to V. to CH. to W. to X. to Y. to Z, which is 16 tooth gear and rack, the rack is fastened to the bolster rail which carries the bolster and bobbin gear with its bobbin. thus the circuit has been completed.

The bottom cone, which governs and controls both the winding and lifting motions, is the important factor and the source of their movements; it comes in at the middle of the train and spreads both ways but still it is not considered in the Lay Constant number calculations.

If one should be interested in figuring out the excess speed of the bobbin, he would start with the bottom cone, using gears p. to O. to N. to M. to R. to O. where the speed enters the differential and this speed is then compounded with the speed of the main shaft at a ratio of 3/29, then it leaves the differential at e. then to f. to g. to h. to k. to l.

The ratio 3/29 is a chapter in itself and we will leave it for a future article. Also the speed from the cone to lifting shaft can be traced, starting with the bottom cone using gears p. to O. to U. to M. to S. to T. to U. to V. to CH. to W. to X. to Y. Then the fraction of a turn of the lifting shaft can be multiplied by .392-inch. The answer is the movement of the rack in inches.

After this degression we will go back to "layers per inch" from the cotton angle.

The factor missing in this Lay calculation is how many layers per inch will a certain hank roving make? Or, in other words, what is the diameter of a strand of roving for a certain hank?

If this diameter is known, one inch could be divided by it and the answer would be the number of layers per inch. The diameter of a strand of roving and its uniformity for a certain hank size goes way back to the cotton in the bale and its mix after being opened.

The picking, carding and drawing all have a bearing on its diameter but the most important factor is the twist that is put in at the roving frames. Slack twisted roving has a larger diameter than a tight twisted roving. It however all comes down to density or compactness. Wire of a certain number can be measured with a micrometer as it is of a uniform thickness and density but cotton is another thing again and the diameter of a strand varies, on the same hank size, with the cotton that it is made from and the conditions of its manufacture.

If a strand of cotton roving was of a known and uniform density its diameter could be figured with accuracy. Density meaning compactness can be illustrated by reference to metals.

Platinum weighs	0.8184	of a pound	per cubic	inch
Gold weighs	0.6975	of a pound	per cubic	inch
Lead weighs	0.4105	of a pound	per cubic	inch
Cast Iron weighs	0.2600	of a pound	per cubic	inch
Aluminum weighs	0.0924	of a pound	per cubic	inch
Cotton weighs	0.0050	of a pound	per cubic	inch
				average weight

Cotton may be more, or it may be less.

In 1880-1884 Mr. Thomas R. Ashenhurst made experiments and deductions on the subject of Diameters of Yarns. His work was enlarged upon with additions and amplification by Sam Wakefield, President of the Stockport District Mill Overlookers' Association in 1914. His investigations were published in a pamphlet (now out of print) and this writer has quoted from this work in part for the following information.

Quotation: "Cotton threads have been treated as true cylinders, and from this supposition all calculations have been based. Cylinders of like diameters have like areas, and since areas of circles are to each other as the squares of their diameters, then their diameters differ as the square root of their areas. Thus:

Area of a circle = $(\text{diameter})^2 \times 0.7854$
Area of a circle of 2″ diameter = $4 \times 0.7854 = 3.1416$
Area of a circle of 4″ diameter = $16 \times 0.7854 = 12.5664$
Square root $3.1416 = 1.772$
Square root $12.5664 = 3.545$
Then as 1.772 is to 3.545 so is 2 to 4.

The counts, size, or numbers of cotton yarns are based on length for a unit of weight:

1 pound of 1s measures 840 yards, or in other

words, if 840 yards of cotton roving or yarn weighs one pound it is number one or if 16,800 yards weigh one pound it is number 20. 840 yards $\times$ 20 = 16,800 yards. Then 1s must have an area of 20 times the area of 20s, but their diameters are proportional to the square root of the areas. This only gives the proportions of the diameters and does not indicate the measurement or actual dimension of the diameter.

Ashenhurst's formula has been based on this mathematical ax'om, (meaning an indisputable truth). His rule stands:

$$\frac{1}{\sqrt{\text{number}} \times 840} = \text{diameter of yarn in inches plus or minus a percentage}$$

The square root of the number is equivalent to the square root of the area and the diameter is proportional. The square root of 840 is empirical (meaning experience). It is in fact the measured diameter of 1s yarn, and this is the only figure from which a dimension of diameter can be obtained from this formula." End of quotation.

Sam Wakefield, in the above paragraph says that "The square root of 840 is empirical". Roving and yarn are volume or bulk. The volume of a round rod in cubic inches is found by multiplying the square of its diameter by 0.7854 and then by its length in inches.

Volume = $0.7854 \times d^2 \times$ length, which means area $\times$ length.

Thus 840 yds is the third dimension in obtaining the volume.

See Fig. 5-A for explanation of area.

Ashenhurst's formula was made for yarns and nothing is said about roving.

Roving with a twist multiplier of 1 to 1.20 has a much larger diameter than yarn with a twist multiplier of 4.50 to 5.00 for the same number. Hence it is fair to assume that the diameter of the yarn must be multiplied by a factor to obtain the diameter of roving after the diameter of the yarn has been obtained.

To illustrate the formula, we will work it out for 3.00-hank roving.

$$\frac{1}{\sqrt{3\text{'s}} \times 840} = \frac{1}{50.198} = .0199\text{-inch, say } .020\text{-inch.}$$

The square root of 3 is equal to 1.732
The square root of 840 is equal to 28.9828

$28.9828 \times 1.732 = 50.198$ which divided into 1 = .0199-inch.

$$\frac{1}{}$$

The answer is *one* 50.198 or 50.19 part of one inch for d'ameter of yarn. Now 1/50 part of an inch is equal to .020-inch, (read thousandths) of an inch which is the diameter of number 3s yarn. We have found by experiment that the diameter of 3.00-hank roving is .047 (thousandths of an inch) and have obtained a factor of 2.35; in other words 3.00-hank roving is 2.35 larger than 3s yarn.

$$0.20\text{-inch} \times 2.35 = .047\text{-inch}$$

.047-inch divided into 1 inch = 21.27 times say 21, thus 21 is the layer per inch of traverse of the bolster rail for carded cotton. Combed cotton will call for a different factor other than 2.35.

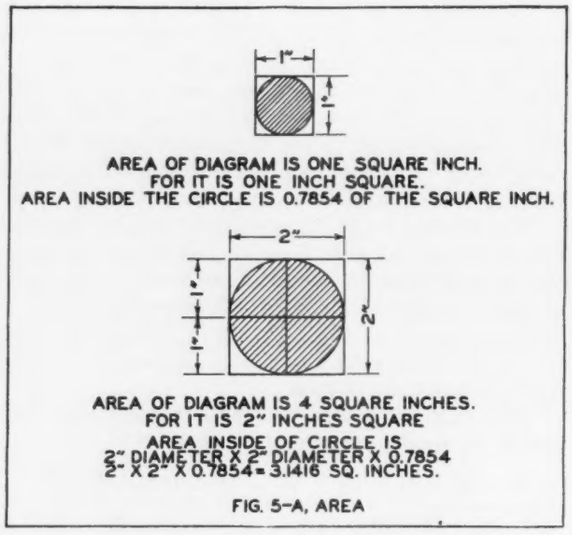
1"
1"
AREA OF DIAGRAM IS ONE SQUARE INCH.
FOR IT IS ONE INCH SQUARE.
AREA INSIDE THE CIRCLE IS 0.7854 OF THE SQUARE INCH.
2"
1"
1"
2"
AREA OF DIAGRAM IS 4 SQUARE INCHES.
FOR IT IS 2" INCHES SQUARE
AREA INSIDE OF CIRCLE IS
2" DIAMETER X 2" DIAMETER X 0.7854
2" X 2" X 0.7854 = 3.1416 SQ. INCHES.

FIG. 5-A, AREA

The only practical value of all the foregoing is that in not knowing how many layers per inch a certain hank roving will make, one can by these figures obtain a number which will closely approximate the layers per inch. Then this number divided into the constant number will give a gear, the number of teeth of which will be a starter. Then after this gear has been applied to the frame, it will be seen whether it ought to be one tooth larger or one tooth smaller or maybe more, according to the conditions at the mill. So one has a base to work from. The rule for Lay is:

$$\frac{\text{Lay Constant}}{\text{Lay Change Gear}} = \text{Layer per inch on bobbin and in reverse}$$

$$\frac{\text{Lay Constant}}{\text{Layer per inch}} = \text{Lay change gear}$$

"Wash" Answers "Carder" and Becomes Philosophical

EDITOR COTTON:

In the March issue of COTTON, on page 97, "CARDER (MASS.)", is frank and honest in making the confession that he had a good laugh when he read my short comments on page 77 of the January issue. The difference between man and the lower animals is that man has the ability to laugh. When "CARDER" laughed, he relaxed, and when you relax you give freedom to muscles, nerves and brain cells. Man seldom has use of his reason when his brain is tense. A sense of humor makes the condition where reason can act.

So, after reading his article, I doubt that his confession is true. Instead, I firmly believe that his mind was tense when he wrote the article. Our mental attitude, our heart's desire, is our perpetual prayer which nature answers. She takes it for granted that we desire what we are headed toward, and she helps us toward it. My heart's desire is and always has been to give the boys in this department the best there is in me, and the boys I am sure know from my past articles that I think of them as well as my-

self when looking in the mirror. If a man reads little, he needs to have much cunning to seem to know what he doth not.

To prove that "CARDER'S" brain was tense when he wrote his article, he overlooked his comments of "A. T. G." which he knows is the vital part of the issue. He stated, "I have read carefully the comments about 'WASH' made by 'A. T. G.' on page 78 of the August 1933 issue of COTTON, and I can heartily endorse all that 'A. T. G.' says."

Well, this is what "A. T. G." says: "The procedure as outlined by 'WASH' for changing the taper on a bobbin without changing the taper gear is wrong. If 'WASH' noticed any change on the taper of the bobbin it was his imagination coming into play."

So, may I ask "CARDER" to have another real good laugh, so his sense of humor will change his condition where reason can act.

Let me give "CARDER" a good rule which every writer should attempt to observe: Never undertake to write upon any topic until you have made a careful study of that topic. Store your mind with knowledge so that your writings will be your thoughts, and above all, do not drift away from any issue, as "CARDER" has done in this article. In the sixth paragraph of his article he claims that he understands the English builder, however, he does not give one single proof that he does. What he states can be found in any machine shop catalog.

Again, "CARDER" states in his first paragraph, "I thought at one time 'WASH' was broadminded, but instead I must believe that he is looking in a mirror and sees only I Am." The human face is the alphabet of the soul. It is the living, quivering record of a man and his ancestors, the tell-tale of all his secret sins, and finely wrought imprint of his highest aspirations.

So, my advice is that "CARDER" make use of the mirror. Let us see what the mirror reflects.

Look up your 1930 October issue of COTTON and turn to page 1363, and there you will find where "CARDER" gives "WASH" a knock. In the March 1931 issue of COTTON, page 457, you will find another knock. In the January 1934 issue of COTTON, page 65, we find another knock. In the July 1934 issue, page 83, another knock.

Now, turn to page 107 of the June 1934 issue and you will find where I state, "In the March 1931 issue of COTTON, page 458, 'CARDER (MASS.)' who is one of the best writers in this department," etc "CARDER" must admit, with the foregoing knocks in mind, that I gave him credit for being a good writer, and also showed a respect for his opinions.

Now, who is the more broadminded of the two of us? Does it not prove that his brain was tense when he makes the following statement in the first paragraph of his article, "It appears that 'WASH' does not care for anybody who does not agree with him." Is it not a fact that I never gave him a knock until he tried to use the sledge hammer?

Can "CARDER" deny that I have praised, as a whole, every contributor to this department? OLD-TIMER hits the nail on the head when he stated, "Some people criticise because of a mere mania for opposition, some

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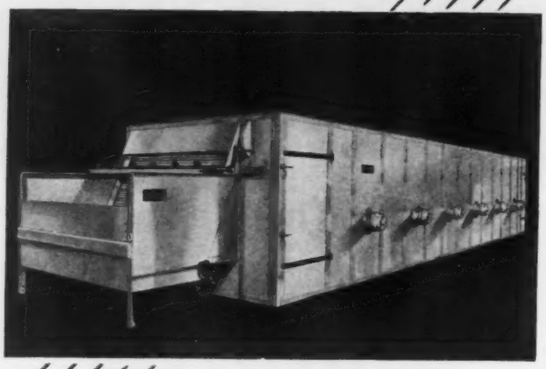

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because of jealousy, and some are just darn fools." This department would render little knowledge to the readers if we always agreed. However, the truth should always survive. "CARDER" also states in his first paragraph, "I am glad I was taught to believe that others' opinions were as good as mine and many times better." But, my dear "CARDER", allow me to remind you that the earmark of your articles does not bear out that fact. If he is sincere in what he says, why did he appoint himself judge and jury in commenting on the different articles in these columns? Like "A. T. G.", he doesn't practice what he preaches.

In the second paragraph of his letter he refers me to THE SCAVENGER ROLL, page 35, January COTTON. Let me add to what he quoted:

Every person has two educations, one which he received from others and one, more important, which he gives himself. Inquire about everything you do not know, since, for the small trouble of asking, you will be guided in the road of knowledge.

In the last paragraphs, "CARDER" claims he understands the English builder. Then let him answer the following, which is the real issue: If you shorten the poker bar on the English builder, will this increase the taper on the bobbin? Please consider this question when you write about those two articles that appeared in the August and September 1933 issues of COTTON.

Again, if he answers me, will he please answer the following questions, which should be easy for a man of his experience:

Why are the layers per inch closer together on the outside of a full bobbin than they are on an empty bobbin on a Woonsocket fly frame?

Which type of flyer will offer the least resistance to the winding of the roving on the bobbin? Why?

In the same issue of COTTON, on page 101, "T. R. (N. C.)" puts the following question: "I would like to ask someone to explain to me just how the taper of a roving bobbin is changed by changing the tension gear in relation to the lay gear?"

The lay gear is considered only for the number of coils desired to the inch. When you change the tension gear so as to give the rack a larger lateral movement, the larger the movement, the greater the amount of the closing jaws of the builder on the American builder; and of course, the change of the carriage is earlier at each change, which gives more taper. Whereas, on the English builder, the larger the lateral movement of the rack, the more the poker bar is shortened at each change of the carriage, and the shorter the poker bar, the greater the angle; and the greater the angle, the greater the taper.

I hope "CARDER (MASS.)" will comment on the foregoing, for he compliments "A. T. G." for stating that this reasoning is all wrong.

WASH (R. I.)

◆◆◆

There is probably nothing so indicative of the advanced changing trends of everything as the new model streamlined autos. How about you? Are you streamlining your ways of management? If not, look out; first thing you know, no employer will want an "old model".—OLD-TIMER.

More About Weight of Squeeze Roll and Slasher Cloth for 22s Warp

Prefers long, light-weight blanket; and discusses importance of tension . . . . . .

EDITOR COTTON:

In response to the questions on slashing brought up by "CONTRIBUTOR NO. 6355", on page 73 of January COTTON and discussed by other contributors in later issues,* I am outlining some of the principles I would follow in running warps of the type to which he refers. He is using 22s warp yarn with a twist multiple of 4.64 and has approximately 3,000 ends per set. His cloth in the gray has a sley of 96 and a pick of 64.

The first question he asks is what would be the best squeeze roll weight. A back roll of about 380 pounds would give good results on this set of warps. The purpose of the back roll is simply to squeeze out the excess amount of size, and if the proper cushion is kept on the roll, 380 pounds of weight will give the desired results. The front or finisher squeeze roll has to obtain the additional results of aiding penetration and giving a good smooth finish to the yarn. With higher speeds on the slasher it is necessary to have this heavy finishing roll to give a good smooth finish to the warps.

The weight of the slasher cloth, about which he also asks, will depend upon the quality of the cloth and the length of blankets used. I would use light weight cloth and long length blankets as this would be more economical and also would give better results on gray goods. However, I would much prefer wool wound rolls to any blanket covered rolls, as the cushion can be more accurately controlled and a more uniform sizing can be expected.

I would consider from 10 to 12 per cent of size to be the proper amount to meet the requirements of this construction. With a sley of 96 it is necessary to have sufficient size on the yarn to prevent chafing of the yarn and matting up in the drop wires. There should be a moisture content of 6½ to 7½ per cent left in the yarn in order to give good weaving results.

If the contributor has automatic controls on his slashers, I would recommend the following temperatures and speeds: size box, 200 degrees F; small cylinder, 240 degrees F; large cylinder, 235 degrees F; and a slasher speed of 30 yards per minute.

If there are no temperature controls I suggest using about 8½ pounds of steam, and regulating the speed of the slasher to get the desired size and moisture content.

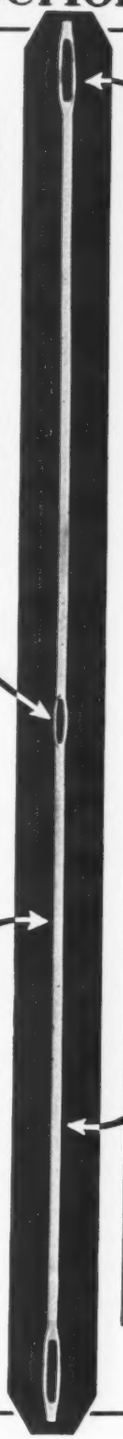
One of the most important things about slashing is the proper tension on the yarn, and this should be highly considered in slashing these warps. If there is too much tension at any point, there is a liability of losing elasticity in the yarn and this will cause excessive warp breaks in the weaving.

There are many things that have a bearing on slasher problems, and I hope that some of the information I have given may prove of benefit to the contributor and other readers.

CONTRIBUTOR NO. 6358

(*) Previous discussions of these questions have appeared as follows: Page 121, February 1935 COTTON; page 97, March 1935 issue; and page 100, June 1935 issue.—THE EDITOR.

What Constitutes the Superior Heddle-



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SINCE 1919.....

Regarding "N. C.'s" Ideas on Combing

EDITOR COTTON:

It is interesting to read the little argument that "JOCK (MASS.)" and "N. C. (R. I.)" are having about half laps and comber brushes.* It is refreshing to see that we still have some comber men who are willing to give their ideas regarding combers to the readers of COTTON. Combing has been a subject too long neglected.

Without doubt, these two men will settle their differences of opinion without my help, and I do not wish to cloud the horizon by a side issue, but the last paragraph of "N C.'s" article in the June issue, page 109, brings out a very important point regarding combing. In the last part of this paragraph he says "for after all, combing is nothing more than carding reduced to a fine point". I do not agree with this idea at all, and feel that the misunderstanding of this point is rather prevalent.

A comber is no more a card, nor combing is no more carding, than a picker is like a card, or picking like carding. The sole purpose of a card is to clean dirt and foreign matter from the stock. Changing from a lap to sliver form, and having a draft of approximately 100 is incidental to the purpose, and not primary. Short fiber is taken out by the card, of course, because the neps and pieces of boll are attached to the shorter fibers and necessarily go along together when the foreign particles are removed. Then a lot of short fiber is taken out in the fly, because the centrifugal force throws it loose, it not being long enough to hold on to either the cylinder wire or other fibers. The same thing happens on the drawing frames, when the short fibers drop out of the web behind the trumpet, and also are collected on the clearers, both over and under the drawing rolls and at the calender rolls. But you would not say drawing was carding, not reduced to the fine point. Carding is, therefore, a process of cleaning, and the removal of short fiber a side issue.

Combing on the other hand is a process of removing a desired percentage of short fiber, leaving only the long, uniform staple, and the cleaning of dirt is a side issue.

If any carder wants to test this theory, let him take some uniform-running average cotton of approximately 1⅛-inch staple, run half of the stock through his regular processes and comb it. The processes should be somewhat like this:

Opener (of some type)
Pickers (either one process or breaker, intermediate and finisher)
Cards
Sliver lapper
Ribbon lapper
Comber
Drawing 2 process

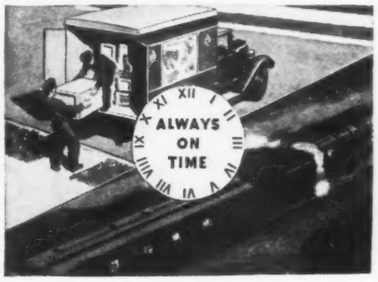
Then take the other half of the stock and run it exactly the same as the first, only when it comes off of the sliver lapper put it through the cards again.

*The author refers to the article "Some Kinks on Combers," by "JOCK", page 93, March 1935 COTTON, and the criticism of this article by "N. C. (R. I.)" on page 109 of the June 1935 issue.

Anything

Anywhere

Anytime



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Of course, the sliver laps will have to be made heavy in order to get the weight behind the cards for the double carding. Then instead of the 2-process drawing, give it 4 processes. Have the weight of the finisher drawing the same for both samples and then run them up into 40s yarn, side by side, on the same machines. Take any number of bobbins from each sample to someone, or a number of men, in the mill and have them pick out which yarn is combed and which is double-carded and double-drawn. If they can do it I hope they will write us a story in COTTON telling us the secret. Now, take the two samples to the break tester and size and break each one, and if they cannot be distinguished from each other, I'd hate to be the comber fixer.

This is just one explanation of the result: combers remove the short fiber and give the yarn extra strength, because the fibers in the yarn are uniform and twist together evenly.

Combers have been called upon to do a lot of extra things, which of course they will do, but they will cost plenty in broken half lap needles, top combs and rolls, which are not strong enough and were not designed to do the work expected of them.

M. W. H. (MASS.)

Enlarging Upon the Pattern for a Good Loom Fixer

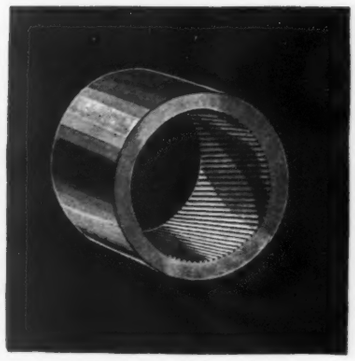
EDITOR COTTON:

I have read the article by "CONTRIBUTOR No. 6369" on "The Qualifications of a Good Loom Fixer", on page 149 of the April issue of COTTON. There are some portions of the pattern on which I would like to enlarge.

While it is true that the loom fixer is one of the important hands in the room, yet even a good one cannot show results with poor equipment and stock. What I wish to point out here is that often when one is told just how important his particular job is to the whole operation, it sort of smacks somewhat of unburdening a certain amount of responsibility onto the person so informed. That is, he feels that it "rests with him" regardless of the previous fellow's performance.

True, it is necessary that a fixer know how to assemble and set the various parts of a loom; further, he should be quite mechanically inclined. Yet, though it be an asset, his being a good weaver is not wholly essential. I know good fixers who were not good weavers and perhaps never would have been.

Weaving at best is rather a monotonous job—there is nothing particularly problematical in being connected with it—and a young fellow who is ambitious will stay at it only as long as it is necessary to absorb the mechanical features, and then he becomes bored. He perhaps is so taken up with the mechanics of the thing that he lets the weaving go to the dogs. Consequently, he is called on the carpet frequently for bad work. At this point in a fellow's career can come a break for good or bad. To keep him plugging at a loom throwing shuttles would tend to discourage him, while a chance to learn to fix would spur him on. A man's work improves with each degree of contentment.



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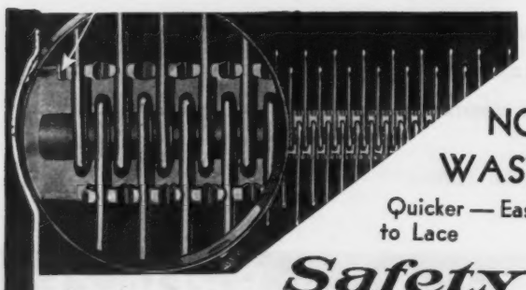

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I have wandered somewhat from the subject, but this bears out the point that simply because a fellow was not a good weaver he could not become a good fixer. The object of course is for a fixer to be able to tie in a warp and start up the loom without leaving things messy. One evidence of a good fixer is where the weavers ask to be put on his section because of the good work and high percentage of production shown on it. Strict observation serves best to detect these qualities in any section man.

Provided a fixer has not been unduly overburdened, it is fair evidence of his adaptability to the job, to note that he has a fair amount of time to himself at his bench. Now the unobserving or the uninformed reader may think this odd, but let us look at it from this angle: The cloth from his section is of good quality, hence the weavers are not being called to the board; the looms are in good mechanical condition, hence he is not being continually called to the looms by the weavers. Now, the reason for most of this is that this fixer is up on the subject of maintenance which is the keynote of his job. When he is at his best he is fixing lug straps, boring holes in picker sticks, preparing pickers, fixing up spare shuttles, and various other jobs which will shorten the length of the time on the next job he is called to. That is what helps to keep his looms on the tight pulley and in turn gives him more time at the bench. Cast-iron fittings which often require a certain amount of buffing and filing take time at the expense of the weaver and the mill, thus when most of the rough preparatory work is done beforehand, the loom is not stopped for so long.

"CONTRIBUTOR NO. 6369" is right in his statement about the oiling of moving parts. Consistency in the application of oil is what counts, as it has been often said that, "A drop of oil is as good as a gallon in the right place." Too much is not only a waste but a hazard, since the throwing and splashing may cause damage to the cloth. Further, with regard to the fixer's interest in the oiling, dry bushings and bearings soon burn out and result in a big job which may set the section man back a half a day in his routine work, especially on a day when there are many warps to put in.

A fixer should have a good disposition, though he should not become too familiar to the extent of favoring certain weavers or running their looms in his spare time. Some of this may sound exaggerated to a few, but we have witnessed all of these things in the course of our work through the mill.

"CONTRIBUTOR NO. 6369" brought out an excellent point when he mentioned the study of cause and effect as it were, with regard to fixing looms. As he says in substance, some men when met with new difficulties will move this, readjust that, re-set the other and so change things about that they don't know where they are. Rather should the thing be studied out by common sense, and then if it be decided to change a setting, do so, and if the result is not obtained it can be put back to its original position and another attempt made elsewhere. It is a process of elimination by which all deductions are made, whether mechanical or otherwise.

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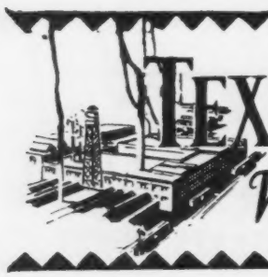

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175. Slashol — Pamphlet describing the many advantages and economy of Slashol for sizing, as compared with tallow. Wm. C. Robinson & Son Company, Dock and Caroline Street, Baltimore, Md.

176. Sonoco Products—A 60 page illustrated booklet giving descriptions, specifications and charts of the many Sonoco products, including: bobbins, cones, tubes, cork cots, roving cans, spools, rolls, etc. Sonoco Products Co., Hartsville, S. C.

177. New Advances in Loom Equipment—12-page booklet describing discoveries and advances whch loom manufacturers have made in keeping pace with these discoveries down to the present time—non-technical, informative, amply illustrated. Emmons Loom Harness Co., Lawrence, Mass.

11. Whitinsville Rings—16 page illustrated booklet, describing ring manufacture, measurements, types, uses. How to determine flange sizes. By Whitinsville Spinning Ring Co., Whitinsville, Mass.

23. Practice of Rayon Sizing in American Mills, Raygomm, Lakoe Gum—Three booklets on products for sizing and finishing rayon and other textiles, presented by Stein, Hall & Co., Inc., 285 Madison Ave., New York, N. Y.

25. "Lupogum" and "Monopole Oil"—Two booklets on textile sizing and finishing products. Jacques Wolf & Company, Passaic, N. J.

29. Continuous Card Stripper—A 20 page booklet describing in detail continuous card strippers, their advantages, the power required to operate, etc. Saco-Lowell Shops, 147 Milk St., Boston Mass.

30. Lubrication of Textile Machinery—32 pages, illustrated. Data covering the economical lubrication of all textile machines. New York & New Jersey Lubricant Co., 292 Madison Ave., New York, N. Y.

38. Sleaziness in Full Fashioned Knitting—Illustrated survey with samples of fabric showing causes of sleaziness and methods to be employed in eliminating it.—By Textile Machine Works, Reading, Pa. (This company also issues parts catalog for Reading full fashioned machines with general information on subject of full fashioned knitting.)

62. Rubber Products for the Textile Industry—A 40 page booklet giving a wealth of information on the proper selection, installation and operation of rubber belts, together with charts showing horsepower rating, pulley sizes, V-belt sizes, also information on all types of hose and rubber covered rolls used in the textile industry. Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.

64. Efficiency and Performance of SKF Roller Bearing Spindles—A twelve page booklet showing the advantages in power consumption, increased production, savings in lubrication, increased yarn breakage strength to be secured through roller bearing spindles. SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.

65. Why Cooper Hewitt Light is Better Than Daylight—A 16 page booklet explaining in detail the importance of good lighting and the necessity of proper quality as well as proper quantity of light. General Elec. Vapor Lamp Co., Hoboken, N. J.

66. Dronsfield's Patent Portable Auto-Feed Needle Point Grinder No. 176—describing a new departure in card grinding—John Hetherington & Sons, Inc., 250 Devonshire St., Boston, Mass.

69. Monel Metal Equipment for the Textile Industry—A 50 page buyer's guide and catalog with more than 100 illustrations of various items of monel metal dyehouse equipment. International Nickel Company, Inc., 67 Wall St., New York, N. Y.

72. The Merrow Butted Seam—A 16-page booklet defining and illustrating the Butted seam, describing its properties and outlining some of the advantages to be gained by its use in textile fabrics. The Merrow Machine Co., Hartford, Conn.

77. Bulletin S 200—Illustrating and describing the new Reeves Variable Speed Drive for spinning and twister frames, explaining its many distinct advantages, and giving charted results of exacting tests. Reeves Pulley Company, Columbus, Indiana.

88. Dayton Cog Belt Catalog—A 32 page booklet full of vital information on power drives, plainly and simply assembled and arranged so that anyone can select the proper standard drive for any condition. It also provides data for the calculation of drives where acquired. The Dayton Rubber Mfg. Co., Dept. C-11, Dayton, Ohio.

93. Metso — Describing this industrial cleanser which has wide use in industrial cleaning of metals, floors, etc., and is used in kier boiling, silk and rayon degumming. Philadelphia Quartz Co., 121 S. Third St., Philadelphia, Pa.

94. New Development by Onyx—Eight-page booklet discribing and giving uses of new developments in sulphonated aliphatic compounds . . . called Aliphatic Ester Sulphate and Glyceryl Sulphates. Onyx Oil & Chemical Co., 15 Exchange Place, Jersey City, N. J.

100. Bulletin 174. Controlling, Recording, Indicating Instruments for Temperatures, Pressures, Humidity, Flow. 40 page booklet illustrating with installation photographs the uses and advantages of instruments built to meet definite requirements. Foxboro Co., Foxboro, Mass.

104. Warp Sizing. National Oil Products Co., Harrison, N. J.

105. Mildew Prevention. National Oil Products Co., Harrison, N. J.

106. Cotton System Warp Sizing on Multiple Cylinder Machines—a folder showing the advantages of this type of machine in making warps of acetate and other synthetic yarns and spun silk.—Charles B. Johnson, Paterson, N. J.

107. Complete Information on Alemite Lubrication. Showing how costs can be reduced through proper lubrication. Alemite Corp., 1828 Diversey Blvd., Chicago, Ill.

110. 3-In-One for Industrial Uses—showing the many industrial uses and advantages of this oil. Three-In-One Oil Co., 70 Varick St., New York, N. Y.

115. How to Cut Cloth Room Costs with Automatic Picking Machines and Improved Inspecting Machines—Hermas Machine Company, Warburton Ave., Hawthorne, N. J.

116. Arcy—Telling in an interesting way the story of Arcy, which completely liquefies ordinary thick boiling pearl starch, and its many advantages. Drake Corporation, Norfolk, Virginia.

117. Anti-Friction Bearings as Applied to Spinning, Drawing and Twisting Frames—This bulletin shows with detailed drawings how a simplified design of roller bearing applications is made to replace the plain babbitt bearings and lists the advantages that are gained. It deals primarily with better continuous production and in consequence freedom from equipment care and repairs. Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.

119. The World's Finest Sewing Machines—a condensed catalog giving details of the various Willcox & Gibbs sewing machines. Willcox & Gibbs Sewing Machine Co., 658 Broadway, New York, N. Y.

120. Goodyear Mechanical Rubber Goods Catalog — 40 page catalog giving practical information and tables helpful in the selection of the proper belting, hose or packing to suit the requirements of the mill. Goodyear Tire & Rubber Co., Akron, Ohio.

121. Engineered Packages for the Textile, Dry-Goods and Apparel Industries—Showing the savings to be made through the use of properly engineered packages of corrugated fibre in the shipping of yarn, woven and knitted products. Hinde & Dauch Paper Co., Sandusky, Ohio.

122. Water Filters and Filtration Equipment—Containing complete description of the chemical processes involved in the coagulation and precipitation of foreign matter, the removal of iron, oil, manganese from water and the production of clean water suitable for the textile industry, together with tables of specifications for standard filters, and information showing the extra profits to be made by the mill through reduction in costs and process difficulties, through removal of undesirable impurities in water. Permutit Company, 330 W. 42nd Street, New York, N. Y.

123. An Outline of History for Anti-Friction Bearings—a treatise outlining the development of anti-friction bearings from their earliest appearance in history to their present important position in industry. Fafnir Bearing Company, New Britain, Conn.

133. Vim Tred Leather Belting — A 32-page booklet describing the "non-skid" leather belting made of VIM leather—the toughest belting material known. This new non-skid belt has a ribbed surface which "grips the pulley like a non-skid tire grips the road."—E. F. Houghton & Co., 240 W. Somerset St., Philadelphia, Pa.

135. The Pick Method of Weaver Wage Payment—A manual of practical information describing methods to be followed in using Pick Counters; suggested forms, and tables included. Durant Manufacturing Co., 1932 No. Buffum St., Milwaukee, Wis.

139. Textile Detergents—Theory of the use of alkalis and control of pH.—This 32 page booklet explains in simplified manner for the benefit of the layman the chemical processes that take place in using textile detergents in the finishing of textile goods. It contains many useful tables and data. Detergent Products Corp., Peachtree Bldg., Atlanta, Ga.

140. Textile Machinery—Improvements in Design and Methods of Lubrication. A discussion of the problem of lubrication of textile equipment covering operating conditions and factors affecting and affected by lubrication. Card Room Operations, Twisting and Spinning Machines, Silk Throwing, Looms, Knitting Machines, etc., covered. Available in copy of June 1934 issue of "Lubrication." The Texas Company, 135 E. 42nd St., New York City.

148. Leather Packing—28 page booklet giving timely hints on the proper selection and installation of leather packings, the various types available, sizes and prices. Alexander Brothers, Inc., 406 N. Third St., Philadelphia, Pa.

150. Engineering Data Book on Mechanical Rubber Goods—21 pages of useful information and engineering data, designed to simplify the selection of belting, hose and other mechanical rubber goods for industrial service, including a review of belting requisites for a wide variety of uses as well as helpful tips on installation procedure. B. F. Goodrich Co., Mechanical Division, Akron, Ohio.

152. Plant Checkup List—Crane Company, 836 South Michigan Ave., Chicago, Ill.

153. Descriptive Folder of the New Low Cost Hermas Shear—Hermas Machine Co., Warburton Ave., Hawthorne, N. J.

154. Johnson Bronze Bulletin No. 340—showing over 600 sizes Johnson general purpose bronze bushings. Johnson Bronze Co., New Castle, Pa.

155. Link-Belt Catalog 1274 on P.I.V. Gear — giving details of this positive variable speed control. Link-Belt Co., 910 South Michigan Ave., Chicago, Ill.

157. Grading Rules and Complete Specifications for Laying and Finishing Maple Floors—Maple Flooring Manufacturers Association, 1794 McCormick Bldg., Chicago Ill.

161. Fence—How to Choose It—How to Use It — book explaining in detail how to choose a fence, determine values and prevent costly mistakes. Cyclone Fence Co., Dept. 4211, Waukegan, Ill.

164. Johnson Rotary Pressure Joints—Bulletin describing this rotary pressure joint which requires no packing, no lubrication and no adjustment, giving installation and maintenance instructions, types, sizes, dimensions and prices. The Johnson Corp., Three Rivers, Mich.

165. New Departure Speed Power Unit—Bulletin giving details of this compact, self-contained driver that gives a thousand different speeds at a turn of the wrist. New Departure Manufacturing Company, Bristol, Conn.

166. Better Cones The World Over—Bulletin describing the Universal No. 50 Winder for silk and rayon. Universal Winding Company, 95 South Street, Boston, Massachusetts.

169. Tube-Tex High Speed Steamer and Finisher—Describing these new steaming and finishing machines for tubular knitted fabrics, which handle cotton, rayon, woolens and mixtures at speeds up to 45 yds. per minute, being unique in that patterns, designs and stripes are finished straight and free from any distortions. H. W. Butterworth & Sons Co., York and Cedar Sts., Philadelphia, Pa.

171. Design of V-Belt Drives—48 page booklet full of valuable tables and data showing the type number and design of V-Belts that will give the greatest efficiency on each particular drive. The Gates Rubber Company, Denver, Colo.

172. Rust Proofing—Free booklet on rust-proofing for spindles, fly frames, rolls and other textile machine parts. Textile Spindle & Roll Corporation, Charlotte, N. C.

173. Over the Rough Spots—28 page booklet describing Stonhard resurfacer for repairing and resurfacing concrete, wood, brick and composition floor, making permanent repairs to badly worn surfaces. Stonhard Company, 401 North Broad St., Philadelphia, Pa.

KNITTING SECTION

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KNITTING SECTION

Microscopy in the Mill

By Samuel G. Newman, B. Ch. E.,
Chemist and Dyer, National Hosiery Dyeing Works

DURING the past decade the aid of microscopy in textile research and ultimately in the mill has come to be regarded as of paramount importance to the textile industry. The microscope and allied optical instruments have virtually shattered their (up to recently) limited confines of the research laboratory and have now invaded the ordinary mill where they are carrying on valuable and progressive work.

The microscope is a great help in the study of textile fibers and fabrics. Each fiber has its characteristic structure and peculiar markings which supply a wonderful means of identification. In many cases this is the only certain method of identification. Chemical tests cannot be very well resorted to in the attempt to distinguish beween different qualities and grades of cotton, wool or linen. It is the microscope which is given full play in this situation and in many similar ones to bring out the necessary findings. The microscope is a wonderful wool and cotton classifier and some mills depend on it for their constant supply of mature fibers.

In many of the textile operations in the mill, the microscope is put to good practical use. Microscopic tests made from time to time determine whether the fibers, yarns, etc., are up to specifications in quality. Mildew and bacterial damage in fabrics is detected with the aid of the microscope. A microscopical examination determines whether or not such defects are caused by mildew. Once the type of growth is identified, the method for eliminating such growth in the goods is applied.

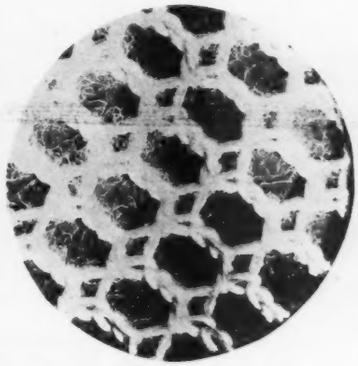
Where mercerization is carried out examinations are made to show whether the threads are receiving any irregular mercerization. The unmercerized portion of threads appear quite distinct under the microscope. The action of chemicals such as acids and alkalis and their effects on goods are studied. The weighting of materials is also examined.

The microscope helps the dyeing department to examine the action of prolonged boiling of the goods. Streakiness in dyed fabrics, unlevel dyeing and other problems are all studied, too. In the case of rayon goods that are streaky, one of the possible causes may be determined by the examination of the filament cross sections of the fiber. Many of the dyeing defects may be prevented when the goods are given a preliminary microscopic examination. For example, a dyer who is given a batch of unexamined goods containing regenerated rayon, supposedly free from any acetate silk, and then discovers upon viewing the dyed lot the presence of undyed specks and streaks, will appreciate the use of the microscope for preliminary tests of the goods. The risk taken by many mills through placing the raw materials into process without a preliminary examination is great indeed. The cost of a microscope supposedly saved by not purchasing it is lost a number of times in the course of a year by reprocessing a batch of goods.

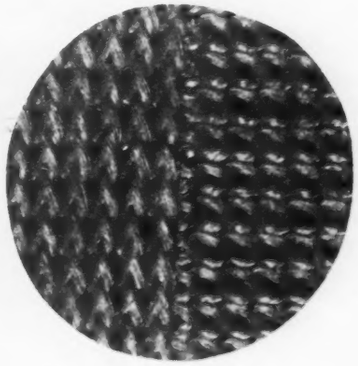
One practical microscopic method in the study of, for example, the penetration of dyes into the fibers is roughly carried out as follows. A cross section of the specimen is first prepared. A bundle of fibers, approximately two inches long, is taken and embedded in a resistant material such as paraffin so that a candle-like substance is produced. Very thin sections are necessary for this purpose. They are made with the aid of a sharp razor or a microtome, an instrument with a very sharp cutting edge used for cutting cross sections of fibers. The specimen should be free from foreign materials such as finger prints, dust, etc. when it is being mounted on the slide. The specimen is then properly focused and is ready to be studied.

The microscope has many valuable accessories which make it an even more useful instrument in the mill. The camera lucida is an important device for assisting the observer to record what he views

Stereoscopic photomicrograph of a knitted fabric . . . .



Stereoscopic photomicrograph of a novelty knit fabric . .



Photomicrograph showing front and reverse sides of knit fabric

These photographs used through courtesy of E. R. Schwarz. The center one is from "Textiles and the Microscope".

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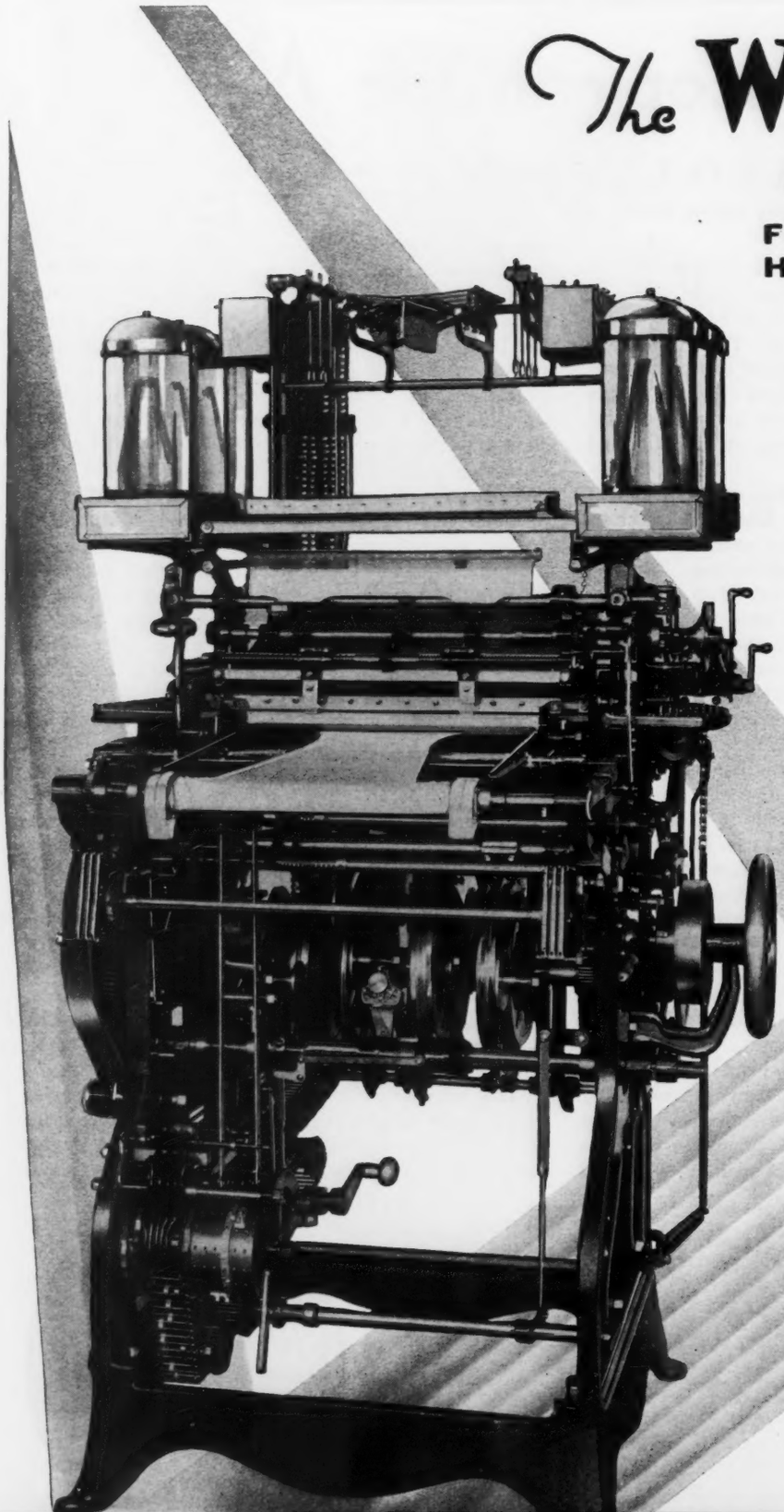

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Full Fashioned Division **Norristown, Pa.**

through the microscope as well as to make measurements of the specimen viewed. The camera lucida enables one to study textiles more accurately and conveniently. Primarily, it is a prism mounted above the eyepiece and has a mirror supported by an adjustable bar. Rays of light coming from the specimen on the microscope stage are combined with light coming from a piece of paper placed beside the instrument. The specimen is seen as though it were lying on the paper and it is simple to draw in the object. For counting objects appearing in the specimen this instrument is of great help. Diameters, angles of twist and areas can be determined by the use of this instrument. The camera lucida also makes possible the determination of density.

For making micrometric determination the filar micrometer and the stage micrometer are important accessories. These aid in the measurements of the fiber lengths, diameter, the thickness of the wall, area, as well as the cross-sectional shape of the fiber. The filar micrometer is used to make these measurements and the stage micrometer is used to determine the value of the eyepiece micrometer with the different combinations of objectives and eyepieces.

The mechanical stage helps a great deal in routine examinations. It permits the complete exploration of the slide. The arms of this mechanical stage are graduated for reading positions in two directions at right angles. These graduations may be in millimeters with vernier reading to tenths. All the above mentioned accessories are easily attached to the textile microscope.

The camera is also an important accessory. Photographs made with the aid of the microscope are used successfully in settling disputes that arise in the mill as to the cause of stains in goods, defects in dyes, or finishing. A great many mill men can study a photograph and learn more from it than they could if they viewed the defect through the microscope. Such photographs serve as permanent records and are referred to from time to time for comparison purposes or for further study. Another accessory used with the camera in making such photographs at low magnification is the Micro-Tessar lense. This lense helps in making of photographs at fairly good magnification over a comparatively large area in comparison to the ordinary microscope objective.

The microscope is an instrument which requires a certain amount of skill to manipulate it properly. This degree of skill depends, naturally, upon the ingenuity of the worker, the type of examination to be made, as well as on the type of microscope in use. For example, an inexpensive instrument which can be carried in the pocket and used anywhere for low power examinations of surface structure, is simple in design and can be used by anyone after hardly any practice at all. A microscopic examination of cotton and rayon can be well carried out by anyone after a few hours' practice. However, the study of the twist per inch of yarns or the determination of mature or immature cotton fibers entails the use of a more highly complicated apparatus. Such a microscope is a much more delicate instrument and requires prolonged study and practice to make accurate determination as well as to acquire a finer technique in the treatment of the specimen subjected to investigation.

The various textile organizations are coming to realize the importance of quality merchandise and consumer protection. More and more is the general trend toward standardization of textiles and the proper fabric labeling. This need of careful testing and determination of fabrics as well as raw yarn quality is enhancing the value of the microscope in this field.

Microscopy in the mill is a comparatively new method of analyzing and solving many textile problems. It has uncovered much valuable information about the fibers while they are undergoing treatment from the raw material to the finished fabric. The microscope has, therefore, built for itself a well-earned position in the textile mill.

Courtesy, Alfred Suter

Hosiery gauge measuring device . . .

These notes only briefly point out some of the many uses that the microscope is put to in the mill. Just a few of the large number of varied accessories have been mentioned to give an idea how appurtenances assist in the study of the fibers during their processing stages. However, it is hoped that sufficient illustrations have been brought out to show what benefits may be derived by the mill from the use of the microscope and to develop an appreciation of its possibilities.

Increased applications and newer techniques are being brought out all the time by textile technological investigators. To cite a case in point, credit may be given to E. R. Schwarz, associate professor of textile engineering, Massachusetts Institute of Technology, for an improved method in the cross sectioning of fibers and for suggestions leading to the practical application of the polarizing microscope for positive identification of the presence or absence of immature cotton fibers. He is credited with other important contributions in the development of textile microscopy. The writer is indebted to Professor Schwarz, under whom he has taken a course in textile analysis and microscopy, for much of the information contained in this article.

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ROYERSFORD NEEDLES

Guess-Work or Accurate Formula Computation---Which?

By a Hosiery Dyer

RECENTLY the writer had occasion to go into a full-fashioned silk hosiery dyehouse where the method of attaining the proper dyeing results and the correct hosiery shades was done through the medium of guesswork rather than by any set accurate formula computation, and while very good results were being attained, it was through the efforts of a capable and exceedingly smart dyer well educated in the use of the dyestuffs which he was using and their method of application. The hosiery was dyed by the split-bath method, which while it is not as widely used or known as the one-bath or the two-bath methods, nevertheless has its advantages and, of course, its disadvantages.

The mill manufactured numerous styles of silk hosiery, ranging from all-silk numbers to heavy cotton top and foot styles, from 1-thread to 7-thread, in chiffons and service weights. No weights of the various styles were used, all the information given the dyer was the number of dozens contained in each lot, and the shade that each was to be dyed. The sizes of the lots varying according to the quantity necessary to fill the orders plus the customary allowance for seconds and bad work which every lot usually contains. As the shades are accumulated in the dyehouse those similar, regardless of the style or construction are placed together to be dyed in the first available dyeing machine.

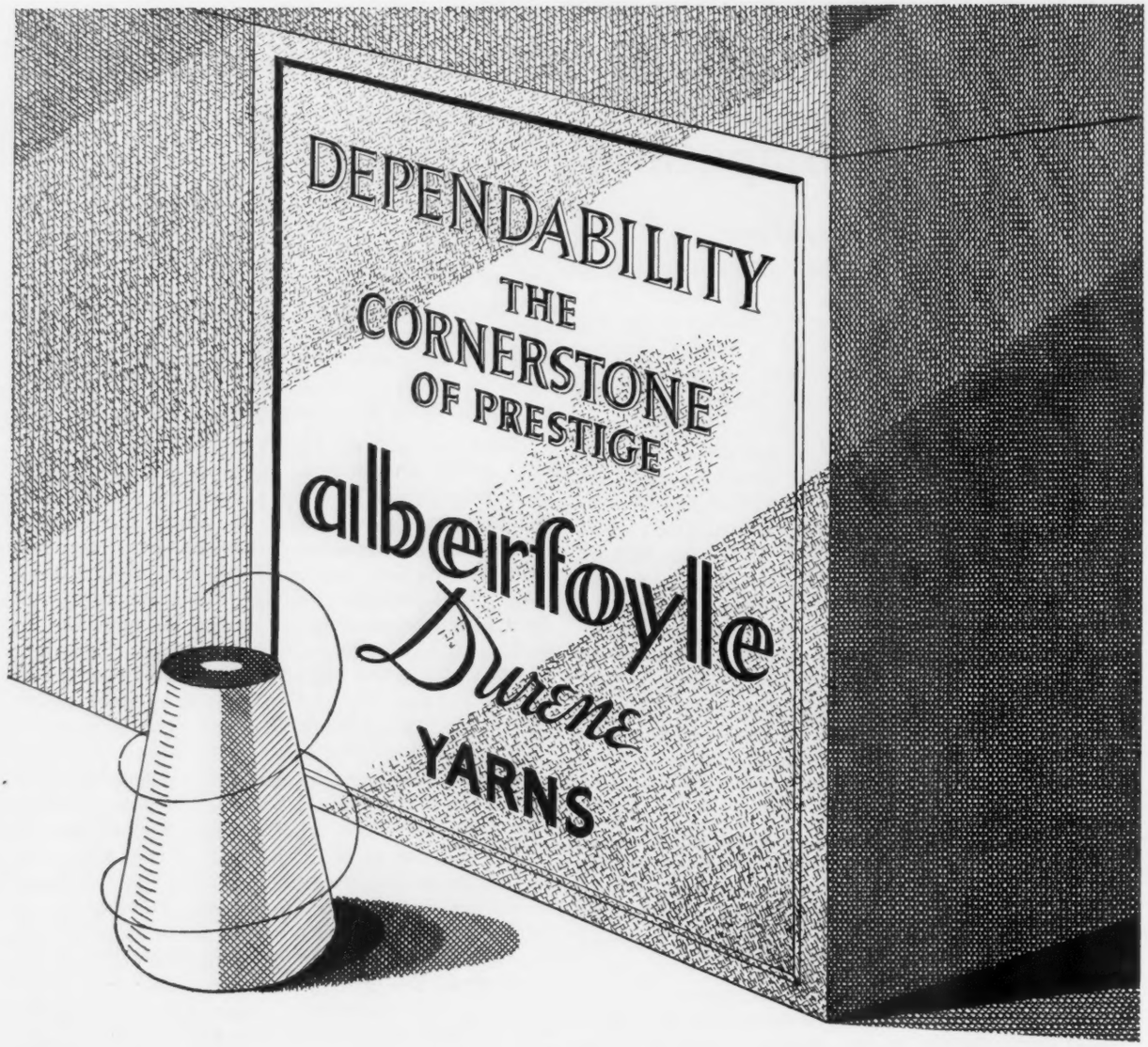
Not having any laboratory equipment, no means were available with which the dyer could first make laboratory samples of the shades or calculate any set formulas. The hosiery was placed in the dyeing machine, and the goods, according to the split-bath method of dyeing, were passed through the preliminary process—a 10-minute run in a boiling bath containing 6 per cent of a boil-off oil, the amount of oil based on the size of the machine. The volume of the bath being maintained at the full capacity regardless of the size of the lot. The 10-minute bath having been dropped, another long bath was immediately prepared with 8 per cent of the same boil-off oil and 2 per cent of a penetrant brought to the boil. Then the dyestuff, previously guessed, although accurately weighed, was added and the bath continued boiling for 45 minutes, after which the steam was shut off and the bath allowed to cool for 10 minutes. A sample was then taken to determine whether salt must be added, or what should be done toward attaining the correct desired shade. If the shade on the first sample was light all was well and the building up process was begun, the time required depending on the ability of the dyer. If the shade became too dark, it was required to reduce the bath one-fourth, one-half, or even to make a new bath and add additional boil-off oil to pull the excess color off the goods, and then build up the shade to the proper degree of perfection.

Having attained this by the described method, the goods were finished with the usual hosiery finishes, the amount used based on the size of the machine in which the goods were being dyed and the bath used being the water capacity of the machine.

What was accomplished? True, the proper shade, but nothing other than a faint idea as to the amount of color required for dyeing the same shade again. Not knowing the weight of the goods that were in the lot, it was impossible to figure any accurate formula for the next lot from what had already been done. If there had been, say, 120 dozen in the lot dyed in a 100-pound rotary dyeing machine, the lot containing two or three different styles, the weight of the goods in the machine could have been almost any weight from about 60 pounds to as much as 120 pounds, or if the hosiery was extra heavy it could be as much as 140 pounds. Assuming that the dyer was given 120 dozen more of the same shade with mixed styles, what must he do but use the same formula that he used before, trusting that the variation in weight will not be much different than the previous lot. Suppose that it was 90 pounds of hosiery whereas the previous lot was 125 pounds. You can readily imagine the trouble that would be in store for the dyer. The goods would be subjected to additional working in the dyebath, which as every one in the hosiery game knows is detrimental to the looks, the feel and the life of the stockings.

The better way to dye goods in the dyehouse, regardless of the method used, would be to determine the weight of each style, and after having first dyed a sample of the desired shade in the laboratory, to compute the results into the correct percentages for use in the dyeing machine for the amount of goods required to be dyed, and, using a dyebath in proportion to the size of the lot in comparison to the size of the machine, to dye the goods in a systematic manner. All that would be required after running the lot the proper time would be an occasional shading until the perfect formula was attained. If care is taken that each step in the dyeing process is carefully adhered to, and the dyestuff weighed up correctly, there is no reason why each lot should not come out almost a perfect match. Much extra work, time and money would be saved and less chafed hosiery would be the result.

A dyer can, of course, after years of practice produce good dyeing by guessing, but how much simpler is the computing of accurate formulas, knowing the correct weights of the goods, and eliminating as much guess work as humanly possible?



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A Further Debate on Looseness in the Edges of Full-Fashioned Leg Pattern

(Editors' Note: A lot goes on with some of the discussions that doesn't get into the magazine. In this case, we're letting the readers in on some "backstage" correspondence, in printing the following further discussions from the two correspondents whose answers to the questions (reprinted at the bottom of this column) appeared in the August issue. When he read in manuscript the original answer from "CONTRIBUTOR NO. 6377", *we had the following criticism from* "CONTRIBUTOR NO. 6378".)

EDITOR COTTON:

I have read with interest the reply of "CONTRIBUTOR NO. 6377", in answer to "CONTRIBUTOR NO. 6371", as to the causes and remedy for loose knitting at the outer edges on full-fashioned legs.* He said that he is "of the opinion that the cause is worn sinkers and dividers, and needles leaning slightly backward due to continuous operation of these parts nearer the center of the head."

He continued: "The outer edges of the head narrow out of operation and these parts are subjected to less wear and naturally these less worn parts will knit looser. The remedy for this condition is to open up the regulating or slacker cam which is a split cam, and put a thin piece of cardboard between the two outer edges where the two sides meet. This will raise the center of the cam to make it slightly eccentric and cause it to knit looser in the center of the head to agree with the loose outer edges. Then the whole head can be tightened to the desired tension."

Now, I am not in an argumentative or critical mood regarding the suggestion of "CONTRIBUTOR NO. 6377", but since I myself expressed some different ideas in answer to this question, I would like to comment on his expressions. I feel that he has written with more haste than he has intended, or rather without giving serious thought to some of his statements. "Needles leaning slightly backward" will produce tighter knitting, and needles leaning slightly forward will produce looser knitting. Generally speaking, needles are kept in much better alignment on either side of the head due to the importance of correct alignment as associated with narrowing points so as to prevent drop stitches in the narrowing operation. If needles out of the range of the narrowing points are not kept in perfect alignment with the needles in the range of the narrowing points there will certainly be a difference in the fabric between the two outside edges and the center of a leg pattern. And the fabric on the outside edges will be loose if the needles are pliered forward and tight if backward.

I cannot agree with his statement that "the outer edges of the head narrow out of operation and these parts are subjected to less wear." It is admitted that the narrowing machine narrows out a certain group of needles on either side of the head. But the slur-cock action on the striking jacks and sinkers remains the same. Therefore, the striking jacks, sinkers and dividers are subjected to the uniform service as related to the slur-cock and catch-bar action. The only difference being that the outside needles and sinkers are relieved of their thread load, which is certainly negligible and should not produce a noticeable difference in wear of these outside parts as compared to parts in the center of the head.

The suggested remedy of shimming the slacker cam to a slightly eccentric condition carries some possibility of correcting the trouble referred to if it is definitely found that sinkers and striking jacks in the center of the head are worn more than those on

(*) The original question prompting this discussion, appeared on page 111 of March 1935 COTTON, as follows: "One thing that has given me quite a bit of trouble in knitting full-fashioned hosiery is a looseness at the edges on either side of the fabric. This is more noticeable in the wide part of the boot or to the main narrowings. I have taken all ordinary means such as the proper gauging, etc., and, too, I might say the verge plates are in good condition, so what would you suggest I try next? I have my ideas or theories but don't know that they are right, but I will set them down here: First, when the slur-cock strikes the first few jacks, the sinkers are thrown forward farther than the remainder of the sinkers because the tension on the silk increases just a bit more away from the selvage and will hold the sinkers in check. Second, the loose course is always on the starting side and not on the finishing side. Third, by running the slur-cock forward as far as safety will permit, we can improve the fabric."

The original answers to this question from "CONTRIBUTOR NO. 6377" and "CONTRIBUTOR NO. 6378", which started all of the accompanying debate, appeared on page 99 of August COTTON.

WE invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All acceptable contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statement of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

◆ ◆

the outside edges. But I would certainly advise a definite proof of such conditions before shimming the cam. Better still would be to put in new sinkers and striking jacks, but I can't conceive of this being necessary except on a machine which has either given many years of service or has been badly abused.

CONTRIBUTOR NO. 6378.

Editor's Note: Then, when we sent this criticism from "CONTRIBUTOR NO. 6378" to "CONTRIBUTOR NO. 6377", the latter gentleman replied as follows:

EDITOR COTTON:

I have read with much interest the comments of "CONTRIBUTOR NO. 6378" on my reply to the inquiry of "CONTRIBUTOR NO. 6371" as to the causes of loose knitting at the outer edges on full-fashioned leggers. At the time I wrote this reply I felt somewhat inclined to go into more minute details for fear that such an argument might be presented, but it was "my attitude that the inquirer had at least a reasonable amount of information on the subject of the inquiry". For this reason I decided not to go into the details of worn sinkers, striking jacks, etc., but since the question has been raised I will give my experience on this subject in reply to the criticism of "CONTRIBUTOR NO. 6378."

When we put in our first full-fashioned machines it was the custom to run less than a full needle bar, usually about eight needles, out on a side. The sinkers and dividers were left in to run without the thread load. About three years ago the trade demanded a full needle bar so we put in the extra needles and began knitting full width. There was a space at the edges of the welt eight needles wide where the sinkers and dividers and striking jacks had not been worn by the thread load, that knit much looser than the rest of the welt. We had to put in some worn sinkers to correct the trouble.

Several weeks later I was visiting a neighboring mill and the superintendent pointed out to me the same difficulty he was having. They were operating Hillscher machines while we operate Reading and Lieberknecht machines. I feel sure the mill in question will be glad to corroborate this statement. Since there is no question about the idle sinkers and striking jacks wearing less than the loaded ones, it follows that the wear on the outer edges is less than on the rest of the head.

Even the seamless manufacturer is familiar with the thread load wear on sinkers. The sinkers on the heel and toe side of the cylinder wear more than the long needle side. So for anyone to argue against this simple law of physics is just plain stubbornness.

"CONTRIBUTOR NO. 6371" asked for a remedy and not an argument. I am perfectly willing to abide by his verdict as to who has given him the most simple and least expensive solution to his problem. Let us hear from "CONTRIBUTOR NO. 6371".

CONTRIBUTOR NO. 6377.

Editor's Note: We then forwarded to "CONTRIBUTOR NO 6378" the above rebuttal from "CONTRIBUTOR NO. 6377", and here is the former's reply:

EDITOR COTTON:

I appreciate your sending me in advance a copy of the comments from "CONTRIBUTOR NO. 6377" to my own observations regarding his reply to "CONTRIBUTOR NO. 6371".

Through some hook or crook an effort has been made to draw me into a controversy which appears to me as being absolutely foreign to the original inquiry. And since "CONTRIBUTOR NO. 6377" has exactly expressed my feelings in his last paragraph wherein he states that "CONTRIBUTOR NO. 6371" asked for a remedy and not an argument, etc., I am certainly not disposed to accept his apparently ruffled feelings, evidently on account of some existing sore spot which has been produced by former arguments, to lead me into any further controversy. I am perfectly willing to follow his suggestion of allowing "CONTRIBUTOR NO. 6371" to be the judge and render his verdict as to who has given him the more correct solution to his problem, simple or otherwise.

Referring now to my recollection of the original inquiry, "CONTRIBUTOR NO. 6371" left no room whatever for one to assume that his machines had ever been operated at any time with idle needles or sinkers on either side of the head. His problem was one of loose knitting for an inch or more on either side of the head, with one side worse than the other. His theory—which I still insist was the wrong theory—was that the drag or tension on the yarn increased as the laying in of the thread advanced, and therefore loops were formed on the outer edges with less tension on the yarn than in the center of the head. I gave my answer to his theory, and still think my argument sound. I gave some suggestions for correcting the trouble which I still believe will correct it, and I had no thought of stubbornness, plain or otherwise, in my reply.

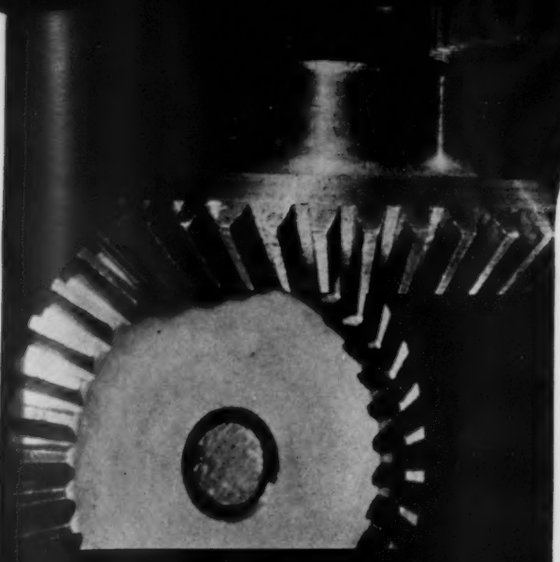
The question of worn sinkers, thread load, etc., is to my mind foreign to the original inquiry. The inquirer definitely stated that his trouble of loose knitting was worse on one side than the other, which clearly indicated to my mind some of the troubles enumerated in my first reply. I am perfectly willing to admit that where a thread load is heaviest on sinkers that the most natural tendency is for more wear on the sinkers affected. I am not willing to admit, however, that an idle sinker should be pressed further forward against the verge plate than a loaded sinker, and I will defend a position that where a legger is producing chiffon hosiery of the kind mentioned by "CONTRIBUTOR NO. 6371", and all the sinkers and needles of the head have been employed, that it will take a good many years for the sinkers in the center of the head to become worn enough to show any appreciable difference in loop construction from one side of the head to the other, granting, of course, that the proper slurcock adjustment is maintained at all times, and that verge plates are kept in good condition.

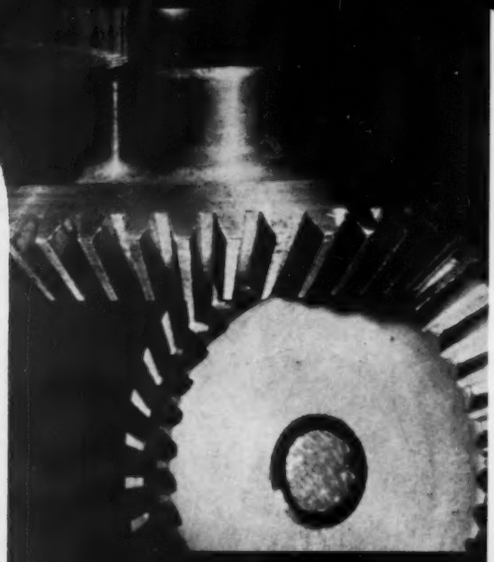
CONTRIBUTOR NO. 6378.

Editor's Note: The reply of "CONTRIBUTOR NO. 6377" to the above, was as follows:

EDITOR COTTON:

I have from you an advance copy of the come-back from "CONTRIBUTOR NO. 6378", and I have no further comments, except to say that he raised a question on



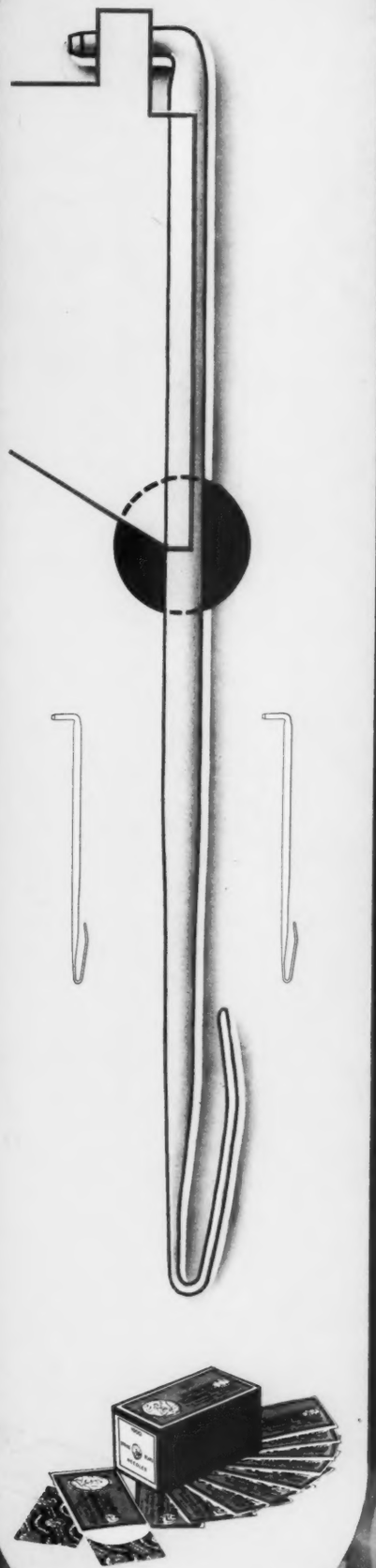


MACHINE-MADE MEANS

Uniform Width and Thickness

In knitting needles it is important that thickness as well as width be entirely uniform at the point where they leave the needle bar.

Look at the diagram. It is evident that the needle must fit snugly, securely, so that there will be no sidewise motion. Too, it must be held so firmly by the clamp that no forward or backward motion is possible. Dropped stitches, uneven knitting, any one of a dozen ills can result from needles not held firmly in position.



For this reason the width and thickness of Torrington needles are determined by machines that are capable of amazing accuracy. Because machines control every detail of their manufacture — width, length, temper, finish, etc. — Torringtons are recognized as the standard of quality among good knitters everywhere.

OUR PHILADELPHIA AND CANADIAN RENEEDLING PLANTS

1 Every job handled by experts with special modern equipment.

2 Each job kept intact on an individual truck throughout the process.

3 Bars are washed in a special fluid; scrubbed with revolving brushes.

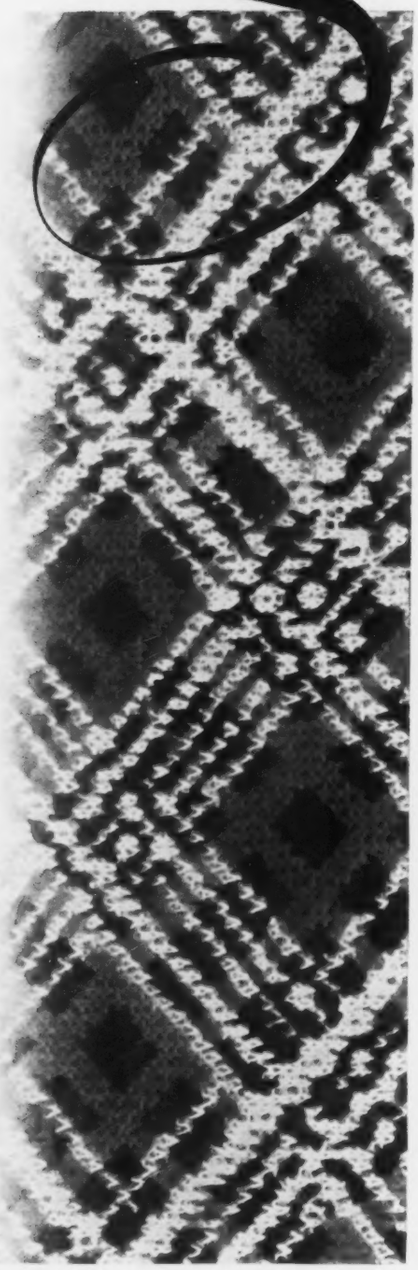
4 Bars are straightened with a special device; brasses resurfaced; slots checked mechanically.

5 Bars filled with Torrington needles; straightened and gauged three ways; spaced also — by gauge.

6 Beards raised uniformly; checked by gauge for height and central setting.

TORRINGTON Spring Beard **NEEDLES**

Smooth needles



go hand in hand with SMOOTH KNITTING

In the making of a fabric like this there can be no compromise with quality—in materials, workmanship, machines . . . or needles.

Of all the factors that contribute to success in knitting none is more important than strong, smoothly finished needles. The smoother the finish the more easily the threads slide across their surfaces . . . the more even and uniform are the stitches they produce. Smooth needles . . . smooth knitting.

Torrington needles are made by machines to assure *extra* smoothness . . . *extra* strength and uniformity. In addition they are subjected to the most rigid system of inspection that modern needle making science has devised. For these reasons they are acknowledged favorites among good knitters.

You can rely upon Torringtons to be accurate, dependable, sound in every detail.

The Torrington Company

ESTABLISHED 1866

Torrington, Conn., U.S.A.

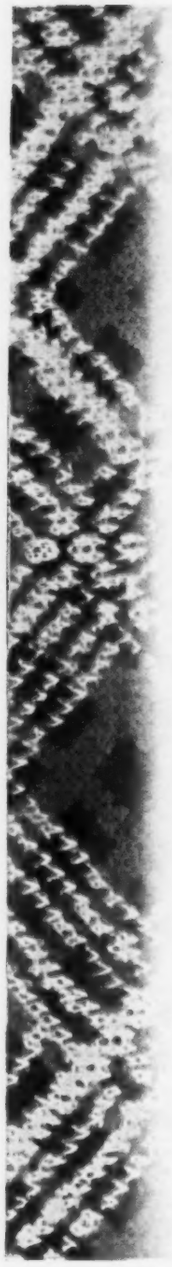
BRANCHES:

THE TORRINGTON COMPANY,	1640 FAIRMOUNT AVE.,	PHILADELPHIA
THE TORRINGTON CO., INC.	200 FIFTH AVE.,	NEW YORK, N. Y.
THE TORRINGTON COMPANY,	538 SOUTH WELLS ST.,	CHICAGO, ILLINOIS
THE TORRINGTON COMPANY,	GUILFORD BLDG.,	GREENSBORO, N. C.
THE S. M. SUPPLIES CO.,	210 SOUTH STREET	BOSTON, MASS.
LOS FABRICANTES UNIDOS,	964 CALLE BELGRANO,	BUENOS AIRES

FACTORIES AT:

TORRINGTON, CONN. — UPPER BEDFORD, QUEBEC

COVENTRY, ENGLAND — AACHEN, GERMANY



TORRINGTON *Latch* **NEEDLES**

which there was no difference of opinion, viz. (quoting him), "I am not willing to admit, however, that an idle sinker should be pressed further forward against the verge plate than a loaded sinker". I agree. This question was not raised. Making the slacker cam slightly eccentric only affects the needles and not the sinkers.

Did you ever get a reply from "CONTRIBUTOR No. 6371" as to the results he obtained from any of the suggestions?

CONTRIBUTOR No. 6377.

Editor's Note: We regret that until now we have had no comment from the original inquirer, "CONTRIBUTOR No. 6371", to whom copies of all of the above were sent, as to his findings and conclusions.

How Do You Dispose of Imperfect Tops on Infants' Fancy Top Goods?

Men manufacturing this type of goods are urged to tell how they handle tops with one or more wrap yarns missing in the design . . . . . .

EDITOR COTTON:

I would like to get through "KNITTING KINKS" from some practical mill men who make infants' fancy top goods some information as to how they dispose of imperfect tops. I refer to such tops that have one or more wrap yarns missing in a design, but which are perfect in every other respect.

CONTRIBUTOR No. 6412

Wants Advice on Best Yarn for Five-Color Knot Tyer

EDITOR COTTON:

I have a problem that I wish some of your "KNITTING KINKS" readers would help me solve. Recently we installed a battery of Fidelity ribbers equipped with the Fidelity 5-color knot tyer. We are making all ingrain work on them. We have tried several colors on these ribbers and find that the knot tyer is not working properly on the knotters using the colored yarns that we have here. We have direct, developed and vat colors. The yarn does not come off the cone freely enough and when the knotter works, it causes the ribber to cut holes in the tops. Our fixers say the yarn is too harsh, that it drags off the cone and will not allow them to put any tension on the yarn at all while the tension is necessary to make the knotter work properly. Also, they say they are unable to tighten up the stitch to make a firm fabric without the ribber cutting the tops full of holes.

What we want to know is what grade of yarn we must use on a 5-color Fidelity knot tying ribber, 180-needle, 36-gauge cylinder, 48-gauge dial, 3¼-inch cylinder? We are now trying to use 36s/2 yarns dyed all colors in direct, developed and vat dyes. What grade of yarn must we use? How should it be treated in the finish? What size cones should be used? What process must the yarn be put through for us to obtain satisfactory running of it on our knotters? Will they run ungassed mercerized yarn if the yarn is treated to make it soft? What steps can we take to get satisfactory results? We have found no difficulty in running regular 36s/2 mercerized yarn tied on to 300 denier acetate. Both are slick and pliable. It is the dyed yarn that troubles us.

CONTRIBUTOR No. 6411

Explains to "Old-Timers" About Removing Courses and Loosening Stitch on Seamless Hose

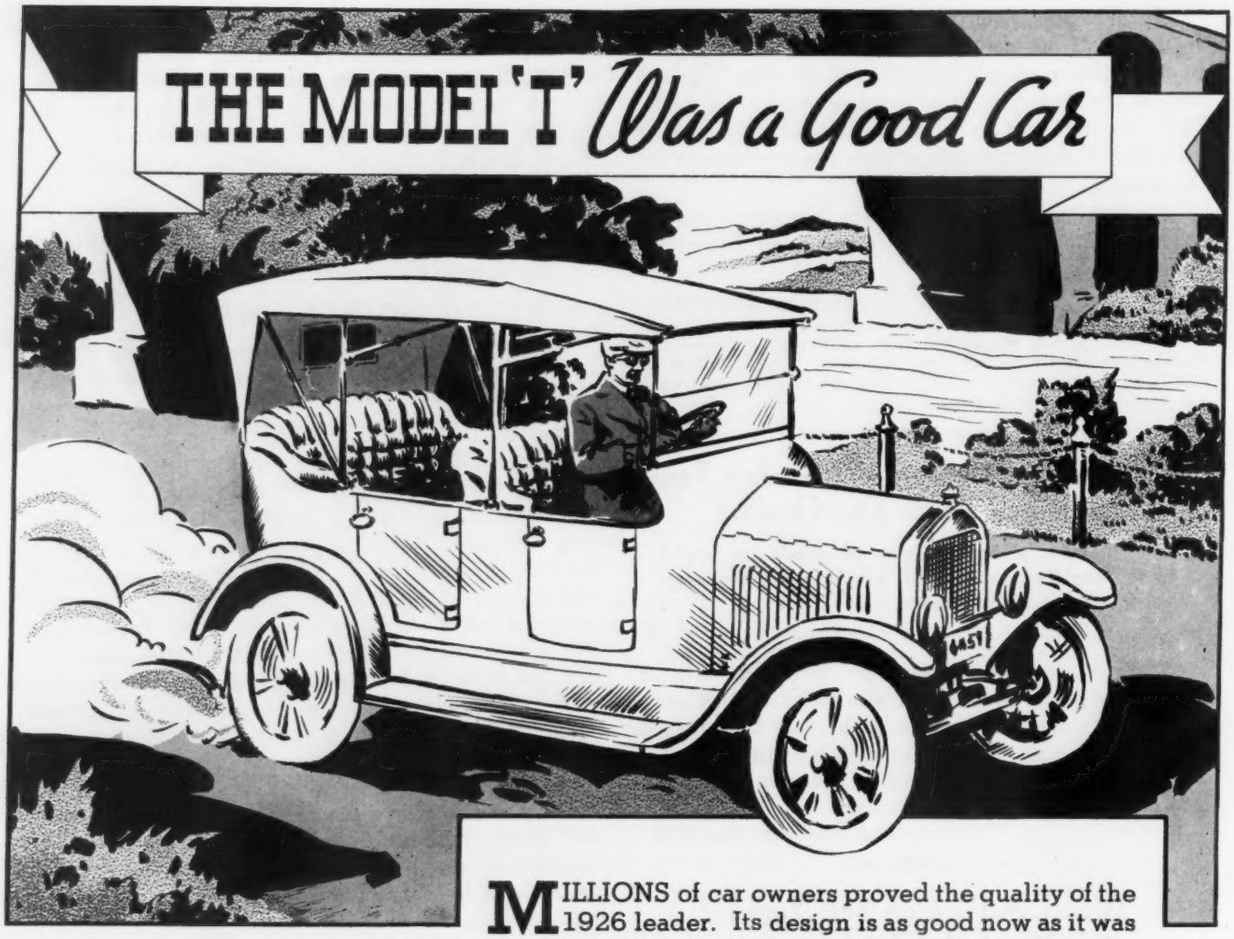
Any other readers, agreeing or disagreeing with what has been published, are invited to send us their views—and reasons . . . . . .

EDITOR COTTON:

I have followed with interest the discussion provoked by the letter on page 137 of the May issue, from "CONTRIBUTOR No. 6381", entitled "A Seamless Knitting Problem". This man explained that one day in his mill, the question of lessening the number of links and making a longer stitch, thus lightening the number, on a ladies' seamless hose, came up. He said two "old-time" fixers said this would not lighten the stocking, but would make it heavier, that is, if enough links were taken out and the same length of stocking made from the same denier rayon. This superintendent pointed out that he felt his two fixers were wrong, and proved them wrong to his own satisfaction. He made a stocking on one machine with standard chain and sized it on the standard board to measure 30 inches finished, and immediately, on the same machine, removed 8 links from the leg and 2 from the foot, sized on the same board to the same length (by lengthening the stitches), and upon weighing the two stockings in the gray, found the first was .07 ounces heavier than the second.

Your July issue carried on page 105 a discussion of this problem by "CONTRIBUTOR No. 6394", who agreed with the first writer, pointing out that, "There are two factors which determine the weight of any stocking in the gray, regardless of what kind of yarns are used. These are the size or count of yarn and the total number of courses knit. If the yarn count is not changed the weight of the stocking cannot be *increased* by removing chain links nor can it be *decreased* by adding chain links.

This man seems to have explained the matter quite thoroughly and correctly, yet I doubt very much that he has convinced the two old-timers that they were actually "off". Theirs was a mistake of misinterpreting data, a fault so often found in practical men. True, they may have removed chain links and loosened the stitch to yield the same length stocking, and have found a greater yarn consumption. Obviously the only explanation is that the yarn sizes varied to give that result. Unless sufficient courses were removed it would be very difficult to detect the savings. For example, assume a stocking was being knit 35 courses per unit and it was decided to loosen the stitch and cut out 35 courses. Assume the stocking originally had a total of 1,350 courses. Removal of the 35 courses is a reduction in courses of 2.6 per cent. The net yarn savings of the reduction in courses is not 2.6



MILLIONS of car owners proved the quality of the 1926 leader. Its design is as good now as it was when it topped the field. It could still be built to deliver untold thousands of miles at low unit cost.

But—higher performance requirements and greatly improved competitive designs have relegated this car to the 'junk' class.

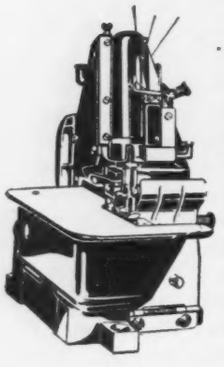
Similar developments are constantly pushing old sewing room equipment out of use. Standards of speed and quality are being raised. New Union Special machines offer improved facilities for many operations.

It pays any manufacturer to check the performance of his equipment regularly. You can't keep up with the competitive procession nowadays driving a Model T.

It's easy to make this comparison. Our Form 374, furnished free, enables you to gather your own cost data and study it for yourself. You don't have to take anyone else's word for the facts about your machines. If new Union Special machines will show big savings—will pay for themselves in a short time—your own comparison will demonstrate that fact.

There's no obligation in requesting this Form 374. Ask for it now.

Old Machines Replaced By These Union Specials



It required only 16 of these "Thirty Nine-One" overseamers to replace 21 old machines in a rayon mill specializing on flat knit undergarments.

Savings amounted to $1.46 per day or $408 per year on each machine. These savings repaid the entire investment in 6.3 months.

UNION SPECIAL MACHINE CO.

400 North Franklin Street Chicago, Illinois

per cent but rather closer to 1.3 per cent, if we assume that the yarn size is exactly the same in both cases. Yarns, however, do not come so accurately sized and hence the accurate detection and determination of a yarn saving is difficult if not impossible when only a small percentage of courses is removed. Over a long period of time the small saving may be noted through inventories. Results obtained on a few stockings should be interpreted as applying only to the few stockings actually tested and not to the entire production.

Testing houses strive to make this point clear when they analyze a specimen sent in to them. Their analysis report clearly states that the results are only for the sample submitted.

To clear up the situation in the minds of the two "old-timers", I am submitting the following method of proving that there is a net saving in removing courses and loosening stitch to yield the same length of stocking. The method brings us back to our kindergarten days when we did all of our calculations with blocks and pegs.

On a flat surface mark off a series of equal squares within a definite rectangular area (see Fig. 1). Place

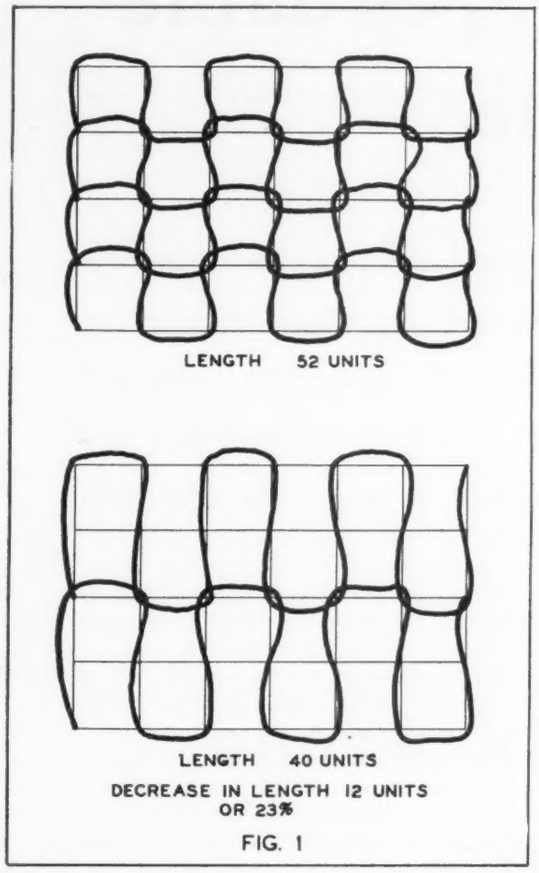


FIG. 1

pegs at each intersection and then lace string around the pegs in a manner approximating a knitting loop. After completing the circuit making stitches only one unit in length, increase the size of the stitch 100 per cent in length, thereby decreasing the number of courses 50 per cent. Measure the length of string in each case and the savings will then be apparent. In this particular case a reduction of 50 per cent in courses yielded approximately a 23 per cent yarn saving.

If the two "old-timers" find it too much like child-play and beneath their dignity to lace string around pegs, let them draw on a sheet of paper the same type of squared design. Then let them draw the stitch formation following the sides of the squares. By counting the number of sides of squares they pass through in covering the same area, they will get a very good approximation of actual knitting results.

Recently, in full-fashioned knitting, this method came in very handy in proving to a skeptic why we would experience only approximately 5 per cent silk saving if the stitch was loosened up, and 10 per cent if the courses were removed to make an equal length stocking.

So tell the "old-timers" to get out their blocks, pegs and rulers. "Seein' is believin'!"

CONTRIBUTOR No. 6413

Helpful Hints on Standard Knitting Machine Fixing

(Editor's Note—This is the thirteenth of a series of articles discussing the parts of Standard knitting machines and giving helpful, practical suggestions on fixing them. The first article appeared on page 129 of April 1934 and gave a history of these machines. The second article, on page 127 of May 1934, covered the parts shown on Plate I in the Standard catalog. The third article, covering Plates 2, 2A and 3, was on page 105 of the July 1934 issue. The fourth article, covering Plates 4 and 5, was on page 101 of the September issue. The fifth article, page 105, November issue, covered Plate 6. The sixth article, on page 107, January 1935 issue, covered Plates 8, 9, 10, 11 and 12. The seventh article, page 111, March 1935 issue, discussed Plates 13 and 14. The eighth article, page 134, May issue, covered Plates 15, 16, 17, 18 and 19. The tenth article covering Plates 20, 21 and 22, appeared on page 125 of the June issue. The eleventh article, page 99, July issue, covered Plates 23 to 24A inclusive. The twelfth article, covering Plates 25 to 30, appeared on page 103, August issue.

The numbers in parentheses following the names of parts are the numbers used by the machine manufacturers for the various parts. It is suggested that the reader refer to the plates in question in the Standard catalog in reading these discussions, and that he clip these articles and file them in the catalog with the various plates for further reference.)

Standard Plates 31, 32, and 33

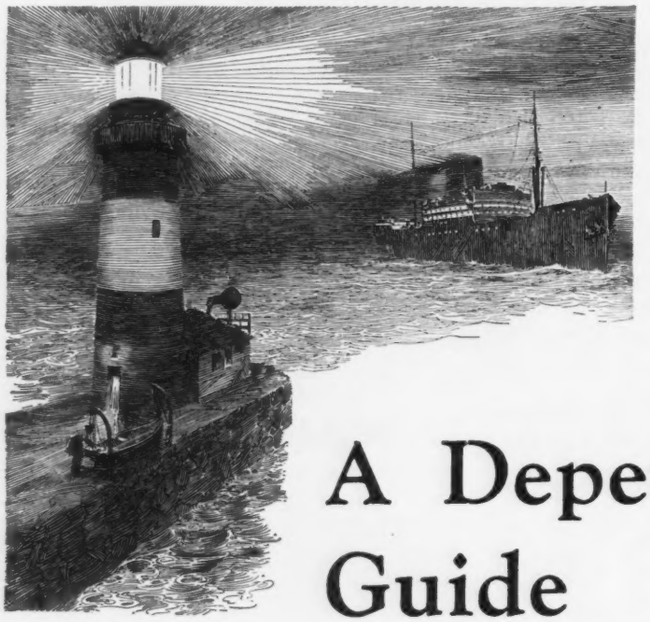
EDITOR COTTON:

The horizontal, positive vertical and figure attachments are shown on Plates 31, 32, and 33. This device was not used very extensively; few, if any, are in use today. The device consisted mainly of six kinds of shoulder butt needles, shown on Plate 31, a special arrangement of stitch cams, guard cams and top cams, shown on Plate 33. The greater part of the controlling mechanism, shown on Plate 32, is similar to that which is used for the reverse plaiting attachment. Unless I have been misinformed, this device is considered obsolete by the machine builders, so a detailed discussion of the parts shown on these three plates will be omitted.

Plate 34

The Reverse Plaited Figure Attachment

Making figures or designs in hosiery by the reverse plaiting method is of course not a new idea, at least not in 1935. Not very long ago, most of the reverse plaited goods were made by using a combina-



A Dependable Guide

AS prudent pilots watch for the guiding beacon, and confidently steer their course by its steadfast, revealing light, so careful buyers of yarn are being guided more and more by their knowledge of the dependable character of "B & C" yarns. They realize that in these fine yarns there lies a sure channel of service and satisfaction.

BOGER & CRAWFORD

Philadelphia

Chattanooga, Tenn. **Lincolnton, N. C.** **Chicago, Ill.**

tion of forward hook, central hook or back hook needles; vertical pin stripes or panels were usually made.

After about 15 years of constant effort, and numerous changes in design, the different machine builders have produced attachments which will really reverse plait and do a perfect job. The first attachment had all the earmarks of being merely a flash in the pan, something which would die a natural death in a very short time. But today, even the Doubting Thomases must admit that reverse plaiting attachments are here to stay.

During the hectic days when machine builders were pushing reverse plaiting attachments, the Standard machine makers built the reverse plaited figure attachments shown on Plates 36 to 40 inclusive. This device reverse plaits by the needle control method; other machine builders use the sinker control method. Standard's first attachment was known as the eight step lever attachment, next came the ten step, and then the trick wheel control shown on Plate 24-D.

First we will consider the needle cylinder assembly shown on Plate 34. The sinker dial is similar to the dials used on plain machines. The cylinder also is made up like a plain cylinder except that the walls on the upper part of the cylinder project forming a ledge which is necessary to support the jack ring. The needle slots in the cylinder are milled about 1/16-inch deeper than normally, beginning at the stitch ring and continuing downward to about the center of the jack ring ledge on the cylinder. The stitch ring is also about 1/16-inch smaller in diameter than stitch rings on plain cylinders. The jack ring is held in position with binding screws (K-1946), additional support being secured from the heads of sinker dial screws (K-1913). The jack ring plate fits into the bottom of the jack ring, and the clamp ring is screwed into the lower part of the jack ring. Note the fine threads on the lower part of the clamp ring.

Reverse plaiting is accomplished by flexing the needles inward, this being done by pressing the jack against the presser and the presser against the needle as shown in the sketch on Plate 34. In order to provide space to flex the needles inward, it was necessary to reduce the size of the stitch ring and mill the needle slots deeper as previously described. The pressers are held in the needle slots by the needle spring bands; the jacks are held in the jack ring by the same method. The jack ring plate provides a flat surface on which the jacks can move in and out, all jacks are held in the same relation to the pressers by the jack ring, thus assuring uniform leverage against each presser.

None of the parts shown on Plate 34 gives any particular trouble; however, there are a few things which can be done to *prevent* trouble from developing. Be sure that the clamp ring is screwed into the jack ring far enough to prevent the jacks from rocking while being pressed inward. If the jacks do not fit snugly in the slots a rocking motion will develop, especially when the jack cam is operating on No. 1 or No. 8 step on the jack. In order to reverse plait properly, the jack must flex the needle inward the same distance on each step; to do this the points of all jacks must contact the pressers in the same place, regardless of the step being acted upon. Keeping needles straight and in a perfect circle is important, also keeping the cylinder clean and free from packed lint behind the needles must not be forgotten. Constant use will cause the pressers to become worn where they come in contact with the needles, for this reason it is a poor policy to mix new and used pressers when replacements are necessary here and there. The better plan is to replace all pressers when some become worn enough to give trouble and use those which are slightly worn for individual replacements. Under normal conditions, jacks do not show a great deal of wear from continued use, new and used jacks can usually be mixed without inviting trouble. And let's not forget that needles, sinkers, pressers and jacks are entitled to a thorough and regular lubrication.

Plate 35

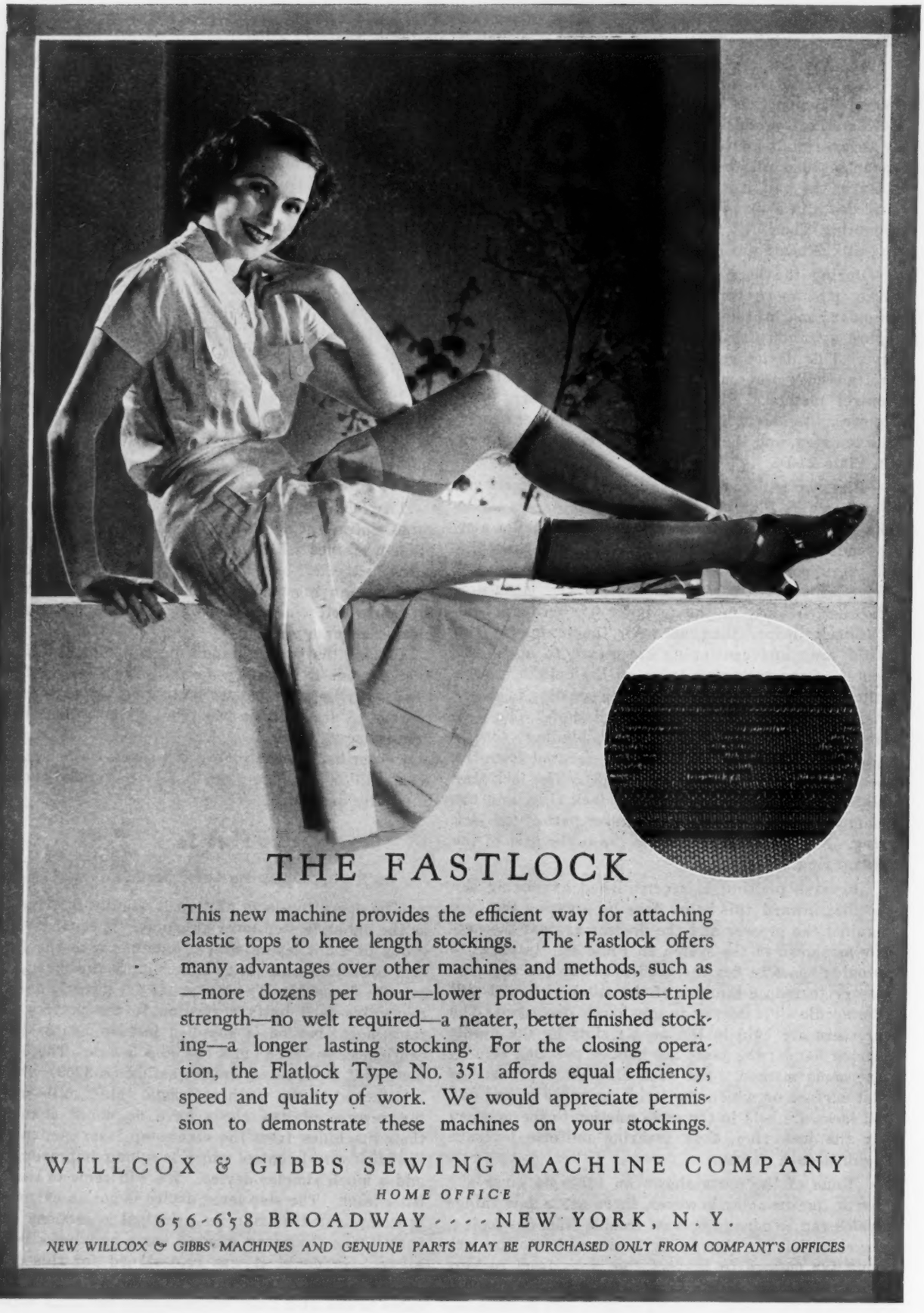
The latch ring used in connection with the reverse plaiting attachment is identical with those for plain machines with one exception: it must have a notch in the left-hand corner of the yarn finger gap as shown on the plate. The object of the notch is to secure better separation of yarns, which assures cleaner reverse plaiting.

Placing the jack ring immediately below the sinker dial made it necessary to make the front half of the cam cylinder in two sections; it would be difficult to remove and replace the front half without this arrangement. The two-piece front half is shown and described on the plate; and several other parts which differ from the plain H set-up are also shown and fully described.

Plate 36

Operating Lever Section

The operating lever section is usually referred to as the old style step lever assembly. It consists of a group of eight levers which, together with the jack cam operators and jack cams, supply the means to actuate the jacks. The jack cams act directly on the respective jack butts according to the pattern arrangement; motion is supplied in turn by the jack cam operator (3268) and the step levers. The complete unit is mounted on the casting (K-3269) which is attached to the machine frame. Most mills making reverse plaited goods have no doubt changed their machines from the eight-step lever control to the trick wheel control which is a later improvement and a much simpler device. We will come to that a little later. The step lever device is not an extremely complicated affair; its principal objections are that it has too many moving parts and lacks flexibility. No doubt it was re-designed for this reason. The step lever action limits the use of the jack cams to one at a time, whereas with the trick wheel control, all eight jack cams can be thrown into ac-



THE FASTLOCK

This new machine provides the efficient way for attaching elastic tops to knee length stockings. The Fastlock offers many advantages over other machines and methods, such as —more dozens per hour—lower production costs—triple strength—no welt required—a neater, better finished stocking—a longer lasting stocking. For the closing operation, the Flatlock Type No. 351 affords equal efficiency, speed and quality of work. We would appreciate permission to demonstrate these machines on your stockings.

WILLCOX & GIBBS SEWING MACHINE COMPANY

HOME OFFICE

656-658 BROADWAY - - - - NEW YORK, N. Y.

NEW WILLCOX & GIBBS MACHINES AND GENUINE PARTS MAY BE PURCHASED ONLY FROM COMPANY'S OFFICES

tion at one time if desired. None of the parts shown on Plate 36 gives a great deal of trouble as far as breakage or wear is concerned. Most of the trouble can be traced to deposits of gummy oil and lint forming between the various moving parts, causing them to bind. A very light oil should be used on the parts shown on Plate 36 for best results.

Plate 37

The jack cam operator lever operators are shown on the upper part of the plate. These are pivoted on the stud (K-3515); four are placed above the spacing collar (K-3335) and four below. The prongs on the step levers shown on Plate 36 fit into the slots of the lever operators (K-3514). The lever operators (K-3514) are actuated by the four upper cams (K-3329) and four lower cams (K-1449). The latter eight cams are pivoted on the end of the striped lever as shown on the plate. Thus, the in-and-outward movement of the striper lever supplies the necessary motion to operate the complete device shown on Plates 36 and 37.

Plate 38

Lever (K-3266) shown on Plate 38, together with the various steel cams, is used to control the striping attachment. Three color stripes can be made in addition to reverse plaited figures. Bracket (K-3511) and release cam lever (K-3510) are attached to lever (K-3266) and are used to control the step lever device. These parts were fully described in the discussion of parts shown on Plate 29 (page 103 of the August issue of COTTON).

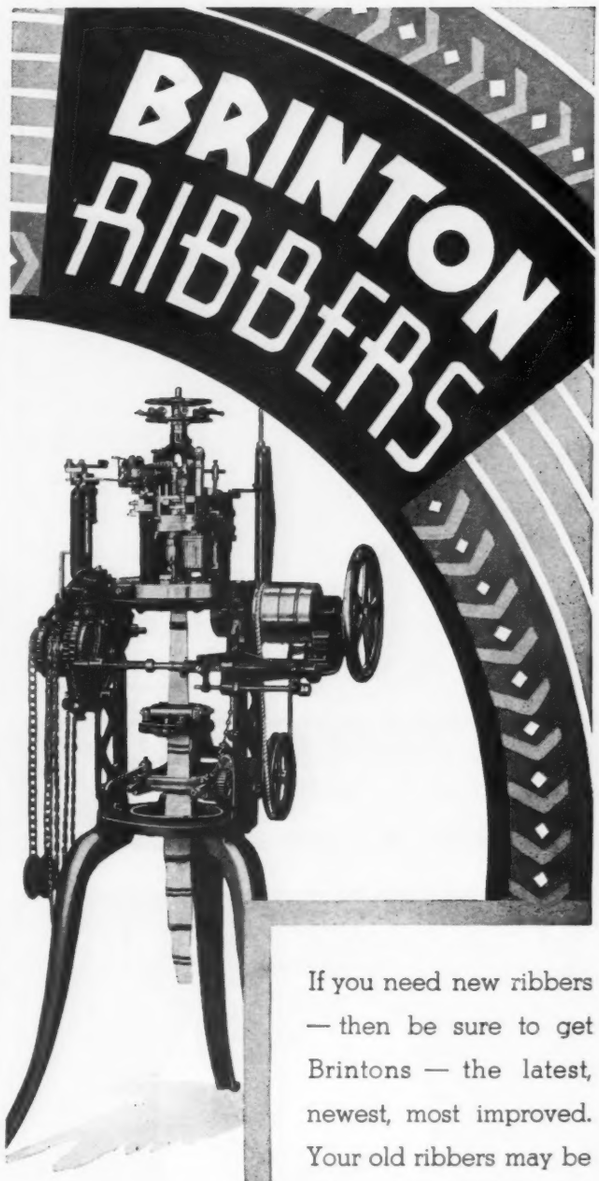
Plates 39 and 40

Two selector levers are required to operate the eight-step reverse plaiting attachment, an upper and a lower. Both levers are shown in detail on Plate 39. The upper lever is operated by chain links, shown on Plate 40, four heights of lugs being required. These lugs ride under the cam (K-3338); the lower lever is operated in the same manner also, by four heights of lug links which ride under the cam (K-1445). Both levers are supplied with a selector (K-1451). These selectors, as their name implies, select the step lever to be thrown into action according to the heights of the lugs on the respective pattern chain links. Both selector assemblies are simple in construction and operation and give little trouble; they are provided with ample adjustments.

Since the step lever control for the reverse plaiting attachment is considered obsolete by the machine builders, I have tried to describe its various parts and their function briefly; as stated previously the trick wheel control was developed to replace the step lever control. If the reader will turn to Plate 24-D and compare the parts shown on that plate with those used in connection with the step lever device, he will readily agree that the trick wheel control is a very clever and simple device.

The trick wheel control will be described in the next article.

MARTIN A. SHAW



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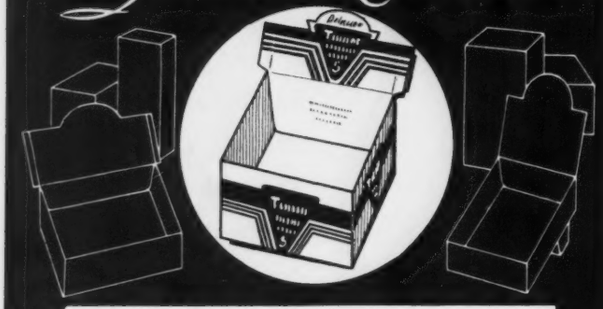

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EDITOR COTTON:

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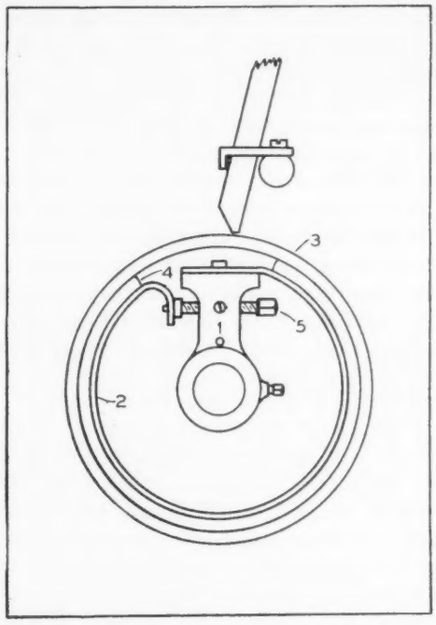
In the drawing accompanying this description, 1 is a casting which replaces the retaining collar on the main drum shaft; 2 is a strip of ⅛-inch cold rolled



SKETCH OF FRICTION FOR MODEL K
The drawing shows a part of a left-side view of a Model K machine. In it, 1 is a casting replacing the retaining collar; 2 is a curved piece of ⅛ inch cold rolled steel; 3 refers to the cam drum; 4 is the leather facing of the brake shoe; 5 is the brake adjusting screw . . .

steel, 2 inches wide, bent into a curved shape as shown in the drawing. Riveted to this is a piece of leather on the outside surface, with well countersunk rivets and the leather placed with the flesh side next to the metal. The brake shoe is securely fastened at the top surface of the casting with two ¼-inch cap screws. The other end of the brake shoe has a vertically slotted hole to admit the reduced end of adjusting screw, 5.

The leather facing of the brake drum should be well soaked with neats-foot oil before attaching and the inner surface of the cam drum should be very smooth. This drum friction needs little attention after it is once adjusted and it causes all the cam changes to take place very smoothly.

CONTRIBUTOR NO. 6368.

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Signal Mountain Meeting of AATCC Sections

THE second annual joint summer outing of the Southeastern and South Central sections of the American Association of Textile Chemists and Colorists was held at the Signal Mountain Hotel on August 2 and 3. R. S. Wheeler, superintendent of the Crystal Springs Bleachery, Chickamauga, Ga., was chairman of the meeting and Robert Cowan of the Quaker City Chemical Company, Knoxville, Tenn., was secretary. Members of the entertainment committee were: S. I. Parker, Henry Gaede, Fred Crayton and Malcolm McKenzie.

Ladies attending the outing were honored at a garden party Friday afternoon. Other events taking place during the course of the afternoon and evening were: A miniature golf tournament, swimming contest, and a bridge tournament. Handsome prizes were awarded the winners.

The men's golf tournament was held on Saturday afternoon at the Signal Mountain course with over 50 players taking part. Winners are given below.

The outing was concluded with a banquet on Saturday night which was featured by a lottery drawing and the presentation of prizes. Credit for the successful occasion is due the entertainment committee, and especially Henry Gaede, for their splendid work.

The meeting was well attended by both salesmen and mill men; there were approximately 160 present.

Lists of prizes (with names of winners and donors) given in the various events at the Chattanooga meeting, follow:

Name	Prize	Donated by:
Mrs. W. J. Kelly, Jr.	Dress Goods	American Enka Corp.
W. A. Sargent	Half hose	Champion Knitting Mills
Mrs. H. O. Shuptrine	6 pr. full-fashioned hose	Davenport Hosiery Mills
Robert Cowan	Fulco Bag	Fulton Bag & Cotton Mills
Mrs. John Bothamley	Monel Metal Table	International Nickel Co.
Mrs. R. S. Cowan	Jordane Upholstery Fabric	Jordane Fabrics
A. T. McDowell	Beach Towel	Lowell Bleachery South
Mrs. Fletcher Kibler	Bedspread	Swift Mfg. Co.
E. W. Klumph	Half hose	Richmond Hosiery Mills
Mrs. J. I. White	Bath Set	Callaway Mills
Andrew J. Kelly	Book	Holliston Mills
Mrs. Fletcher Kibler	Hose	Walker Co. Hosiery Mills
Mrs. H. O. Shuptrine	Dress Goods	Crystal Springs Bleachery
H. O. Shuptrine	Drinking Set	Celanese Corp.

The following prizes were drawn for and distributed in the lottery:
1 lot ladies pajamas, donated by Gardiner-Warring Co.
1 case Labor-Saver, donated by Detergent Products Corp.
6 shirts, donated by Russell Mfg. Co.

GOLF TOURNAMENT

Name	Prize	Donated by:
Frank M. Wood	Low gross, 1 dozen balls	Royce Chemical Co.
T. W. Piper	2nd low gross, Shirt	Atlas Underwear Co.
Nester Grotelueschen	Low net, $10.00 cash order	A. A. T. C. C.
Richard P. Smith	2nd low net, 1 dozen balls	Royce Chemical Co.
Fletcher Kibler	3rd low net, Shirt	Atlas Underwear Co.
R. H. Evans	High score, Shirt	Atlas Underwear Co.
Homer Welchell	Blind bogey, Toilet case	Dixie Mercerizing Co.

Mercerization, Its Place in Relation to Other Finishing Processes

By J. Andrew Clark

(Continued from page 59.)

erations when the fabric is run on the regular mercerizing range with diluted caustic.

Exclusive of novelty effects, which are beyond the scope of this article, mercerizing also can occasionally be used as a means of correcting faulty handling and cloth defects. Of the latter, the well-known trouble encountered in dyeing cloth containing neps, unripe or dead cotton, can be taken as an example. The swelling action of the mercerizing caustic changes the physical appearance of these to approximate that of the normal ripe cotton, and after dyeing, they are decidedly less conspicuous. Irregularities in dyeings on half-mercerized goods can also often be corrected by retreatment with caustic of a higher concentration. The action of the caustic is not cumulative, in that goods once mercerized only acquire increased affinity for colors by treatment with stronger caustic. Thus, any irregularities of the first treatment may be corrected. While this increase in affinity for color is usually thought of as the reason for the greater depth of color obtained after dyeing, it is interesting to note that in the case of previously dyed goods, an apparent increase in color depth can be noted after mercerizing. This, obviously, can only be due to changed optical properties of the fabric.

In conclusion, it would seem that,

Mercerization of most fabrics can be performed satisfactorily after singeing either before or following a kier boil, as well as before or after bleaching.

Fabrics requiring open width treatment may, however, often be mercerized to advantage after dyeing.

Plant and equipment lay-out may determine the more economical position of this operation in relation to the others.

When maximum luster is required, mercerization after the completed bleaching operations should offer the best solution.

Bast Fiber Weakness Is Noted in Textile Research

The Textile Foundation's valuable additions to existing knowledge of the physical properties of textile fibers are continued in the August number of *Textile Research*. G. Gordon Osborne, a Textile Foundation fellow who worked under the direction of Prof. E. R. Schwarz at M. I. T., continues his Observations on the Structure of Flax, Manila and Jute. One of his most important findings is that all bast fibers have the inherent structural weakness that he discovered in ramie; this being due to fissures in the cell wall. These fissures when complementary, or opposite, greatly reduce the fiber thickness at such points, thus resulting in tearing rupture at a lower load than straight tension, and also render the fiber weak to bending and flexure. Severe mechanical treatment tends to accentuate the number and depth of these fissures.

Another valuable contribution in this number is a report on the Degradation of Silk Fibroin by Acid and Alkali, by Eunice Walde and Rachel Edgar of the Dept. of Chemistry, Iowa State College. They find that alkaline degradation of silk fibroin tends to leave a residue poorer in nitrogen, and acid degration a residue richer in nitrogen than the original fibroin. Alkaline degradation of wild silk fibroin leaves a residue richer in nitrogen than the original fibroin or the residue from acid degradation. The more rapid loss of tensile strength than of weight or nitrogen indicates that acid and alkali first bring about a general disintegration of fibrous structure without the formation of soluble products.

McSwain at N. C. State

C. W. McSwain has assumed the position of agent in connection with cotton utilization projects with the Bureau of Agricultural Economics of the U. S. Department of Agriculture, with headquarters at N. C. State College, Raleigh, N. C. For the past nine years Mr. McSwain has been general manager of the Pendleton Manufacturing Co., LaFrance, S. C., and previously had been connected with other mills, and had taught weaving and designing at Clemson College for 16 years. He is a graduate of Clemson, class of 1903.

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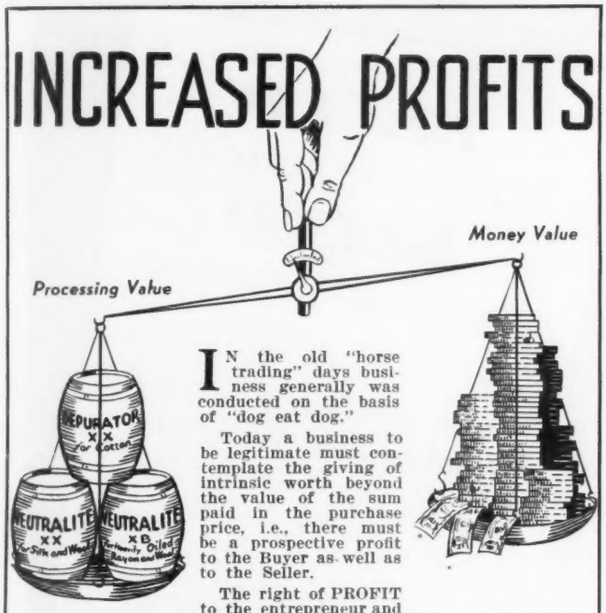
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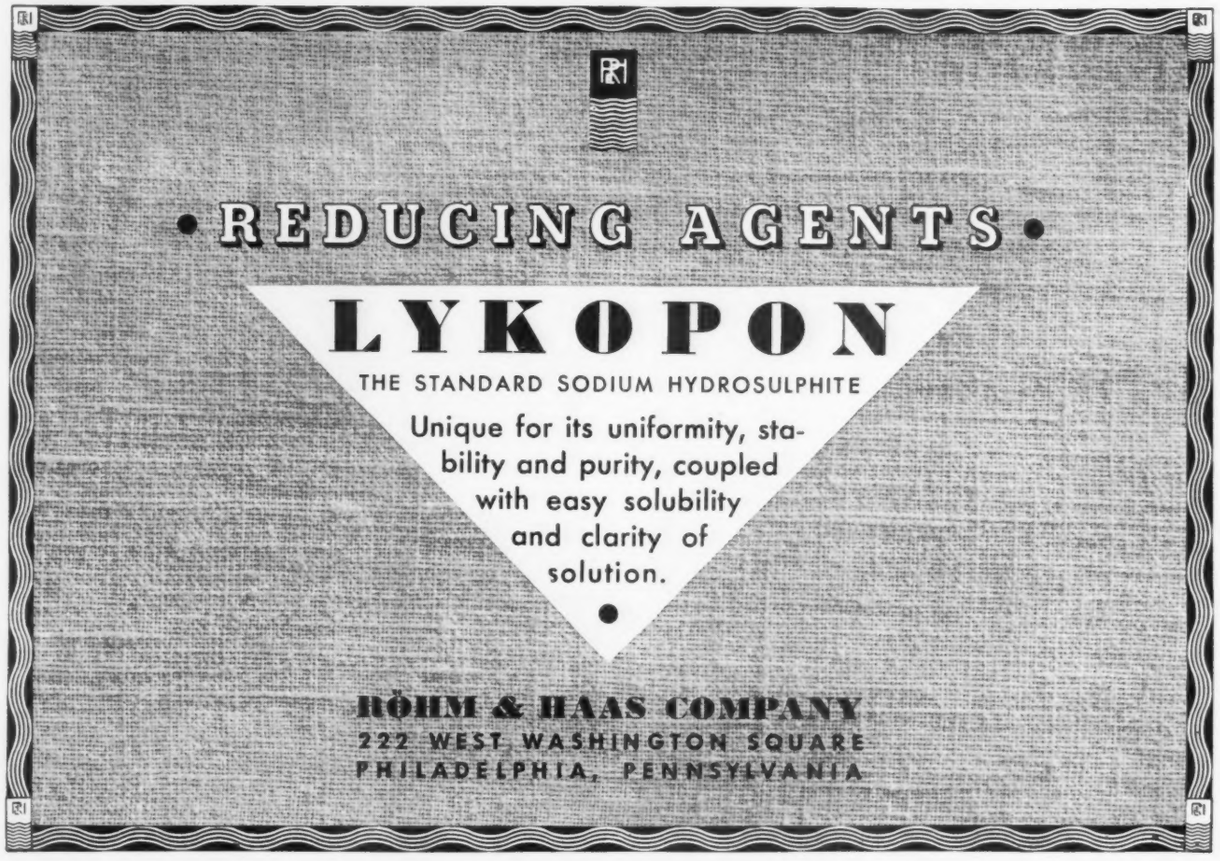
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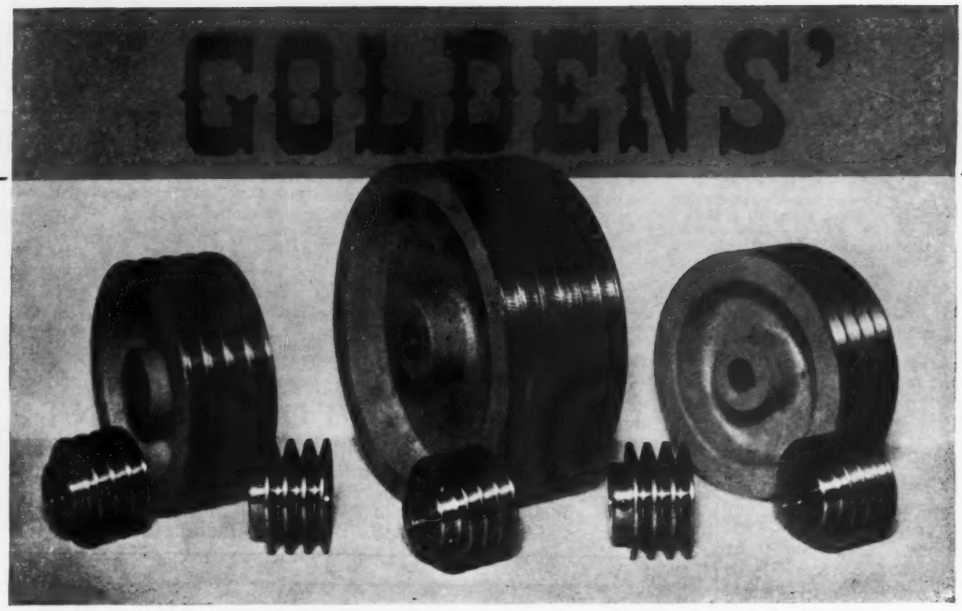

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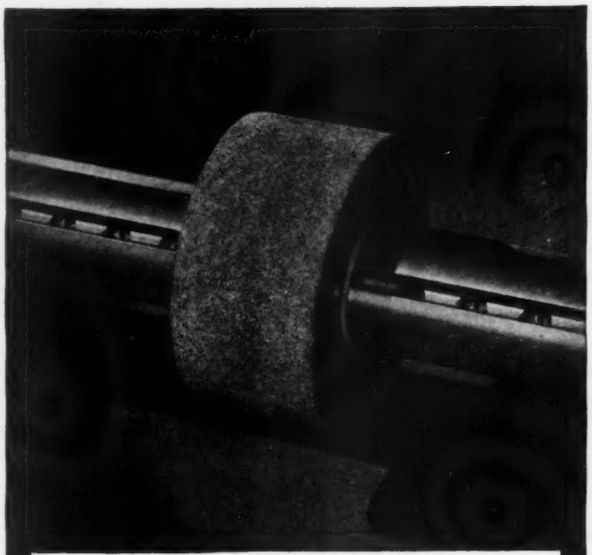

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to these mills through advertising on the Trading Post Exchange page of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement.

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Stronger, Safer, More Durable, More Economical in the Long Run.

Particularly adapted for cotton mill and storage yard fencing. Any height desired.

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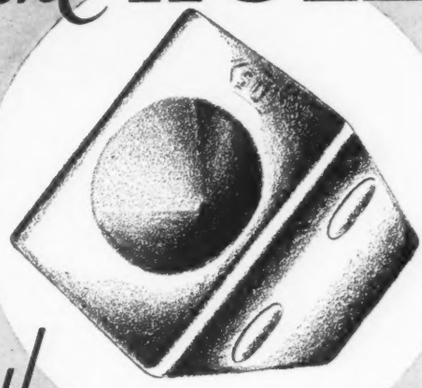
FABRICATORS OF STEEL AND ALLOY STEEL PLATE.

It's the HOLE



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50 TYPE PICKERS Out-Live All Others Because The Life Saver Hole Distributes the Shock.

A machine cuts out a shuttle point hole more accurately than a loom fixer can—yet the 50 Type Picker is the *only* one with a machine-made hole (patented). • Correctly shaped for the shuttle point and evenly balanced between the rivets and the face of the stick, it allows the *whole* picker to absorb the shock — not just the shell. It also permits a *rocking motion* which saves wear and tear.

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Learn how to get the most from the Bonus Zone. See our advertisement on Research Belting in TEXTILE WORLD

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50 TYPE PICKER

THE PICKER WITH THE LIFE · SAVER HOLE

THE GRATON & KNIGHT CO.
WORCESTER, MASS.

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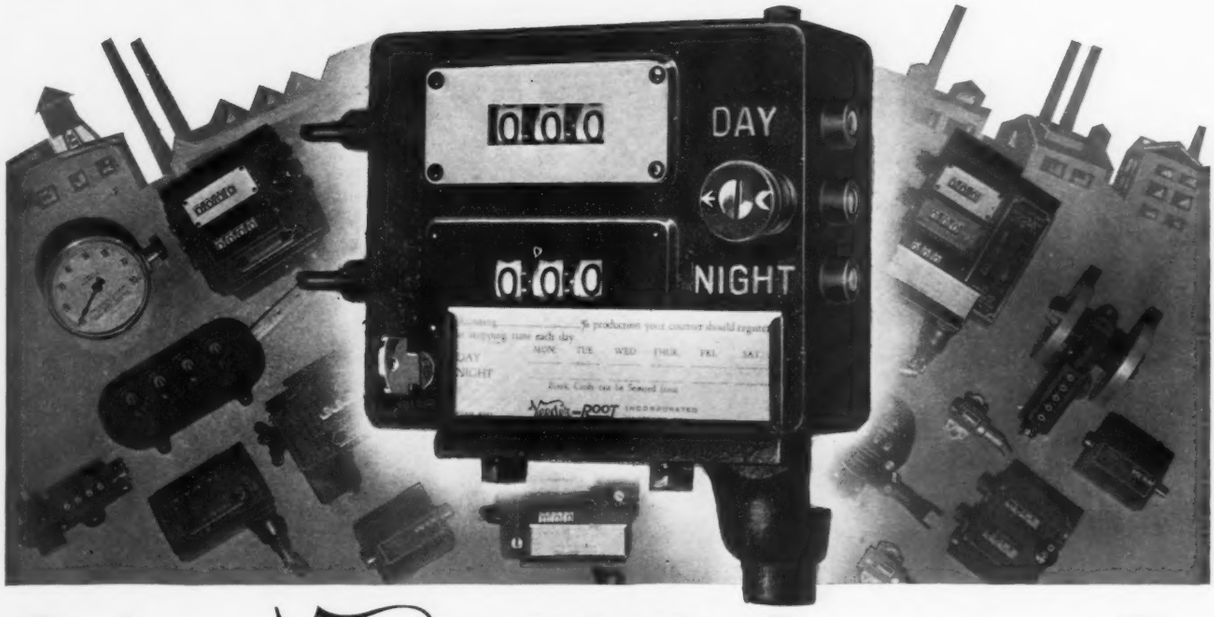
What Veeder-Root Pick Counters are doing on 425,000 Looms



Other Veeder-Root Counters Do all through the mill

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See for yourself the figures of the actual savings made when Veeder-Root Textile Counters are used throughout a mill. See also the complete line of counters that bring about these savings. A Veeder-Root Textile Specialist will show them to you. Call our nearest office.

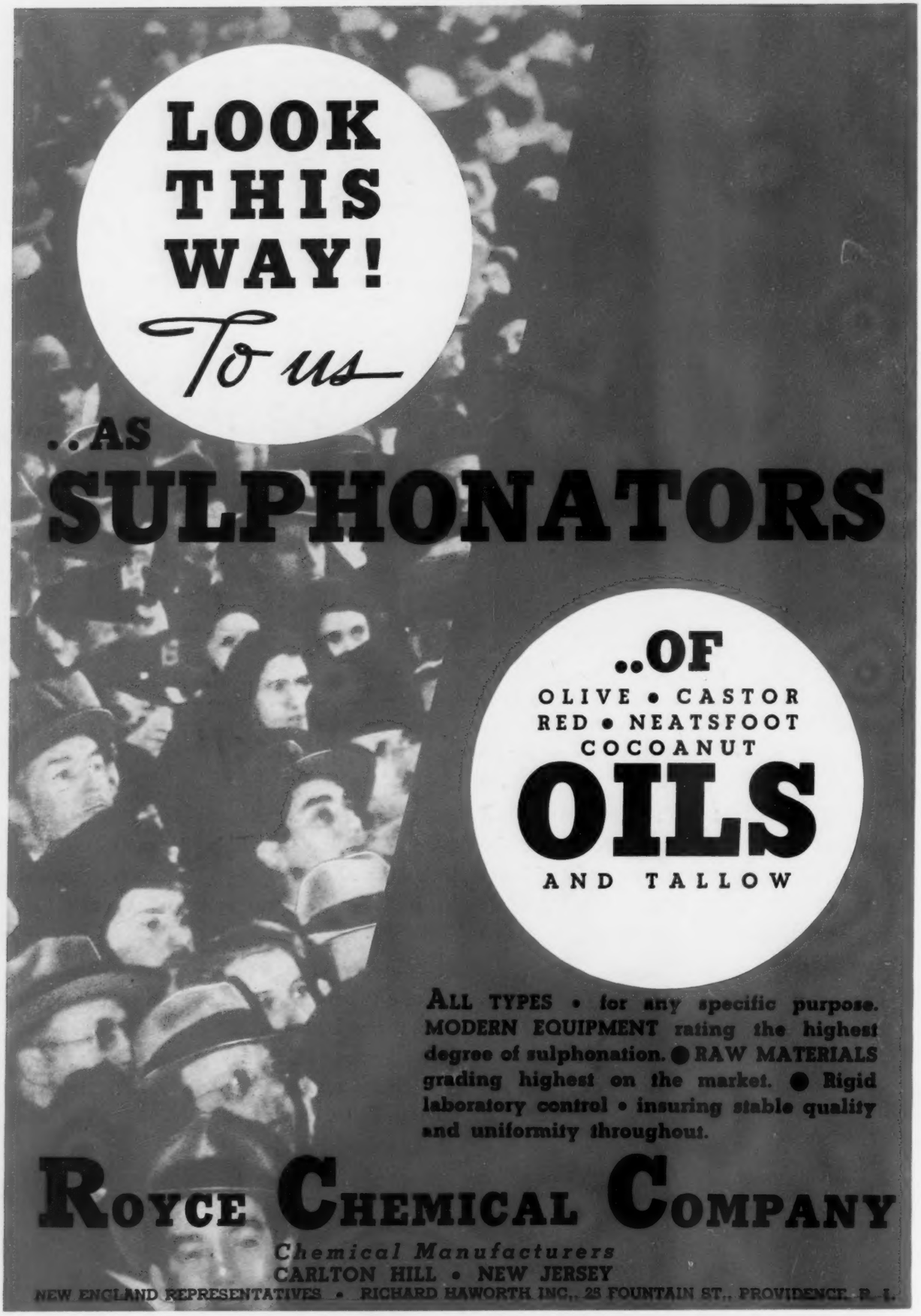
VEEDER-ROOT INC.

HARTFORD, CONN. GREENVILLE, S. C.

BOSTON PHILADELPHIA MONTREAL LONDON

BUILDERS OF COUNTING DEVICES SINCE 1878

1800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AND TALLOW
ALL TYPES • for any specific purpose. MODERN EQUIPMENT rating the highest degree of sulphonation. ● RAW MATERIALS grading highest on the market. ● Rigid laboratory control • insuring stable quality and uniformity throughout.
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